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## PROPHYLACTIC VALUE OF A SINGLE DOSE OF PRECIPITATED PERTUSSIS VACCINE

**(Preliminary Report)**

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It is well known that the precipitation of diphtheria toxoid by potassium aluminum sulfate or adsorption with aluminum hydroxide increases its antigenic efficiency many fold. This increase in immunizing effect is very probably due to the slowness with which the precipitate is absorbed (*1*). The sensitizing effect of proteins is also enhanced by the same treatment, as shown with precipitated ragweed pollen extract (*2*). Since the clinical course of pertussis infection in children indicates that immunity is not developed rapidly, it occurred to one of us (W. T. H.) that a vaccine characterized by prolonged action should offer greater chance for success than one in which absorption and excretion take place more rapidly. Accordingly, an alum precipitated pertussis vaccine was prepared as follows:

One liter of *H. pertussis* suspension prepared according to the Sauer technique (*3*) was obtained from a commerical manufacturer.[1] This suspension contained 10 billion organisms per cubic centimeter in 0.6 percent sodium chloride solution preserved with 0.5 percent phenol. Twenty-seven cubic centimeters of 10 percent sodium bicarbonate solution were added, followed by 250 cubic centimeters of 4 percent potassium aluminum sulfate solution, both having been filtered through a Berkfeld N candle. A heavy flocculent precipitate formed immediately, which was thoroughly shaken and placed at 10° C. After 5 hours the supernatant was decanted, replaced with 0.85 percent sterile sodium chloride solution, and returned to 10° C. overnight. The next morning the supernatant was again decanted and replaced to the original volume of one liter with 0.85 percent sodium chloride solution containing merthiolate 1:7500. The usual bulk sterility tests were done, the material was distributed into 10-cc vials, and the final containers were tested for sterility. No bacteria could be demonstrated in the supernatant; the precipitate, however,

[1] Supplied through the courtesy of Parke, Davis and Company, Detroit, Michigan.

was heavily charged with bacterial bodies. Since no washing of the bacteria had been done at any stage of preparation of the suspension prior to precipitation, it seems reasonable to assume that products of bacterial metabolism may have been adsorbed to the precipitate.

The precipitate causes no unusual reaction when injected into laboratory animals. The indurated area appears as promptly as when alum-precipitated diphtheria toxoid is injected, but subsides more rapidly. Early tests in children gave local and general reactions similar to those encountered with alum-precipitated toxoid in the same age groups.

Clinical trial was undertaken at Cumberland, Md., in children aged 11 to 34 months residing in two wards populated by families of more or less uniform economic status. The children were chosen alphabetically from births recorded as of 1934 and 1935. Those whose surnames began with B, D, F, H, and so on, were left unvaccinated, whereas those whose surnames began with A, C, E, G, and so on, were injected subcutaneously in the arm with 1 cubic centimeter of the vaccine suspension during the period November 10 to 21, 1936. The injection produced a small lump which persisted for a week or longer. The only other reactions noted by the parents and attributed to the injection were three instances of slight fever, one of which was accompanied by anorexia and a sore arm. Four public health nurses under the direction of one of us (J. P. F.) made repeated household visits to the families of all children throughout the ensuing year. They recorded pertinent information concerning pertussis in the family and established diagnoses with the aid of physicians who might be in attendance. No particular laboratory aids to diagnoses were utilized.

During the year an epidemic of pertussis occurred in Cumberland, the peak developing in June, approximately 7 months after the children had been vaccinated. At the end of 1 year, one of us (J. A. B.) revisited the families of the vaccinated and unvaccinated children to study and evaluate epidemiologically the effect of the single dose of vaccine.

Of the 241 children chosen for study, 50 were excluded from consideration on account of the following conditions: 2 children had history of pertussis prior to the beginning of study; 5 had received pertussis vaccine prior or subsequent to the beginning of study; 8 vaccinated and 5 unvaccinated children had surname initials designating them to the opposite group, unvaccinated and vaccinated respectively; 3 vaccinated and 2 unvaccinated children developed suspicious symptoms of pertussis but could not be classified definitely as cases or not cases; and 25 could not be located for observation after the forty-ninth week from the beginning of study. Of the 191 remaining children, 82 were in the vaccinated group and 109 in the unvaccinated group.

All known attributes other than vaccination which might possibly affect incidence of pertussis were distributed between the two groups in close proportion to the number of children in each group, with the following exceptions: males were preponderant in the unvaccinated group as compared with the vaccinated, and in this small study had an incidence of pertussis higher than females; also children with other susceptibles in the same household were in greater proportion in the unvaccinated group than in the vaccinated, and had an incidence of pertussis slightly higher than children with no such susceptibles in the household. The weight which should be given to the distribution of these attributes is questionable, particularly as regards sex. Considered both individually and collectively, these two disproportions in the distribution, measured strictly by the ratios of incidence shown in this study, would tend to bring about an incidence of pertussis in the vaccinated group lower than in the unvaccinated. The magnitude of such an influence, however, is insufficient in itself to account for the observed difference in incidence between the vaccinated and unvaccinated. The influence of the second mentioned attribute (the presence of other susceptibles in the same household), though on general grounds conceivably more important than sex, was in this study almost negligible.

During the year 10 cases of pertussis occurred in the 82 vaccinated children, an incidence of 12 percent. Seven were classified as mild cases, 2 moderate, and 1 severe. Twenty-one cases occurred in the 109 unvaccinated children, an incidence of 19 percent. Three of these were mild, 11 moderate, and 7 severe. Among the 191 children there were 18 "household exposures"; these were defined to include exposure to infection throughout the course of a case of pertussis occurring in another child of the same family under 10 years of age and living in the same household, but excluded such exposures where the observed child developed pertussis less than 7 days following onset of the primary household case. Eight such "household exposures" occurred in the vaccinated children and resulted in 3 cases; 10 such exposures occurred in the unvaccinated children and resulted in 8 cases.

## SUMMARY AND CONCLUSIONS

A commercially prepared pertussis vaccine was precipitated with alum and the precipitate resuspended in saline solution to its original volume. One dose of 1 cc of this suspension was given to each of 82 children who, together with a similar group of 109 unvaccinated children, were subsequently observed for 1 year, to study the possible value of this vaccine in preventing or modifying cases of clinical pertussis.

The observation revealed that reactions following injection of the vaccine were negligible; that the incidence of clinical pertussis in the vaccinated group (12 percent) was lower than in the unvaccinated group (19 percent); and that of the total 31 cases occurring in both groups, the cases in the vaccinated group showed a preponderance of mild and a sparsity of severe attacks. These observed differences between the two groups are in no way convincing from a statistical standpoint and do not permit the conclusion that this vaccine had any prophylactic value for prevention or modification of clinical pertussis. At best, the differences suggest that the vaccine might have some prophylactic value, too little, however, to be demonstrated as real in the small group of this preliminary study.

In consideration of the small amount of antigen injected, the results are believed to justify further clinical trial on a larger scale, using a longer period of antigenic stimulation. Definite plans for such trial are in progress and contemplate the injection of two doses of vaccine separated by an appropriate time interval.

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## THE INCUBATION PERIOD IN UNDULANT FEVER

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There have been few opportunities to determine the incubation period in undulant fever; available estimates refer almost exclusively to *Brucella melitensis* infections. We have found no measure of this interval in naturally acquired infections due to *Br. abortus*. The study of cases occurring among persons temporarily absent from a large urban area served almost exclusively by pasteurized dairy products appeared promising. New York City has an ordinance requiring the pasteurization of all milk or cream sold commercially, except the certified product. This law has been enforced for more than a decade. It is estimated that the proportion of certified raw

milk sold has been reduced from 2.5 percent in 1928 to less than 1 percent in 1937. Epidemiological inquiries would accurately identify the users of this "superior" brand. Butter sold commercially is prepared from pasteurized cream, as is the byproduct buttermilk. Cheese has not been incriminated in the spread of brucellosis. The residents of New York City therefore are almost entirely free from exposure to living *Brucellae* through the consumption of raw dairy products, and most certainly have no direct contact with the domestic animals which are the usual sources of these infections. One would expect that undulant fever, if it does involve such individuals, would be acquired only during intervals of absence from the city.

Excluding clinically questionable infections and those with diagnoses unconfirmed by laboratory examinations, a total of 89 cases of this infection has been reported to the New York City Department of Health from the time that the first case was reported in 1928 to the end of 1937. There were 32 cases reported in 1936 and 1937 during which time adequate means for its detection in the laboratory have been routinely applied. No records were found for the three cases reported in 1928, and seven early reports were too incomplete to permit satisfactory analysis. Twenty-four of the patients were nonresidents who came to the city when ill for hospitalization or treatment. We have also omitted from further analyses three chronic or complicated infections, since in these cases there is greater uncertainty as to the true chronological relationships.

There remain 52 cases involving city residents. Ten of these are known to have been continuously in the city for several months preceding onset. Two of these patients were packing plant employees, and we believe that they acquired the disease in their occupational pursuit. Another was a painter in a pasteurizing plant who intentionally drank large quantities of the raw milk. A fourth was a user of certified raw milk. Two of the early cases gave a history of obtaining unidentified "loose" milk at a price below that currently charged for reliable brands. We believe it is reasonable to suspect that they had been obtaining a "bootleg" product not coming within the requirements of the milk laws and regulations and not pasteurized. It was affirmed in four cases that the patient had not been away from the city and had consumed only pasteurized products from acceptable sources. Two of these were children 8 and 10 years of age; one of the adults was a janitor, the other a salesman. The recent use of the phosphatase reaction has demonstrated that defects in pasteurization do occur. Possibly these cases are further evidence of this. However, during 1936 and 1937, when records on the disease were collected with greater care, no unexplained acute infection was found. It is noteworthy that in a population of over 7 million only four such

cases should be discovered within a period of a full decade. This stands in marked contrast to the experience in rural and small urban centers served largely by raw dairy products.

Eighteen of the forty-two individuals who had been out of town within a possible incubation period, had had repeated business or week-end trips, and most of them gave a history of a corresponding intermittent use of raw dairy products. There had been only one trip in each of 24 cases, and this trip was preceded and followed by several months continuous residence in the city. The onset occurred in three cases prior to return after periods of 1, 6, and 8 weeks away from the city, and in four cases the individuals remained away for 3 months or more. Thus there remain 17 cases to provide evidence relative to the incubation period.

Characteristically the onset in undulant fever is insidious, and particularly so in infections due to *Brucella abortus*. The chief difficulty in computing an incubation period was the uncertainty in the patient's own mind as to the actual date on which his illness began. An extreme example of this problem is illustrated by one patient who was out of the city during the first week in June. He spent his vacation on a farm where he drank raw milk freely. After his return he remained quite well until the middle of July. He then began to note an unusual fatigue. About 1 month later a nonlocalized abdominal discomfort appeared. These two complaints continued but did not cause physical incapacity. However, on November 15 he was taken rather suddenly more severely ill with fever, chills, and sweats. He was admitted to a hospital on December 1, where his condition was diagnosed. A prodromal period as long as this is unusual, but commonly it may be measured in weeks rather than in days. The incubation period, therefore, will vary, depending on the definition of the onset. For this reason we have sought to ascertain from the records the date of the earliest symptoms and also the onset of those of such severity that rest in bed was sought, or the counsel of a physician obtained. The differentiation was possible in 10 cases; in the others we were forced to assume that the dates coincided.

The relevant observations concerning these cases are summarized in table 1. Maximum and minimum incubation periods have been calculated, placing the exposure dates respectively at the beginning and at the end of the vacation periods. Means are also indicated, dating these from the onset of the earliest symptoms and from the beginning of the severer ones. The median of the mean incubation periods computed to the onset of earliest symptoms in this small series is 10 weeks; to the onset of severer symptoms 13 weeks. Considering the minimum period and including the three cases with onset prior to return to the city, there was a wide and rather even distribution of from 1 to 16 weeks, with the median at 6.5 weeks. There were five

TABLE 1.—*The incubation period in 17 cases of undulant fever*

| Case | Date of report | Sex | Age | Occupation | Dates out of city | Onset | | Incubation period in weeks | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Earliest symptoms | Severe symptoms | To earliest symptoms | | | To severe symptoms, mean |
| | | | | | | | | Maximum | Minimum | Mean | |
| 1—I. M. | Jan. 1932 | M | 23 | Clerk | July 2–Sept. 15, 1931 | Nov. 4 | Nov. 10 | 18 | 8 | 13 | 14 |
| 2—B. S. | Feb. 1932 | F | 40 | Housewife | Aug. 19–Sept. 1, 1931 | Dec. 25 | Jan. 15 | 18 | 16 | 17 | 20 |
| 3—B. B. | Dec. 1932 | F | 56 | do | May 15–Aug. 1, 1931 | Sept. 12 | Sept. 12 | 17 | 6 | 11.5 | 11.5 |
| 4—A. B. | Nov. 1933 | F | 54 | do | July 23–Aug. 15, 1933 | Oct. 13 | Oct. 20 | 12 | 8 | 10 | 11 |
| 5—L. T. | Feb. 1936 | F | 55 | do | Aug. 7–Sept. 20, 1935 | Dec. 15 | Dec. 15 | 18 | 12 | 15 | 15 |
| 6—J. H. | Mar. 1936 | M | 29 | Lawyer | Aug. 28–Sept. 4, 1936 | Dec. 10 | Dec. 10 | 15 | 14 | 14.5 | 14.5 |
| 7—R. S. | Sept. 1936 | F | 40 | Housewife | Aug. 2–Aug. 9, 1936 | Aug. 25 | Aug. 25 | 3 | 3 | 2.5 | 2.5 |
| 8—W. B. | Nov. 1936 | M | 45 | Truck driver, dept. san. | July 15–Aug. 12, 1936 | Oct. 22 | Oct. 22 | 14 | 10 | 12 | 12 |
| 9—J. B. | do | M | 26 | Bookkeeper | July 1–Aug. 8, 1936 | Sept. 20 | "Later" | 12 | 6 | 9 | (?) |
| 10—W. M. | Dec. 1936 | M | 45 | Court reporter | Aug. 10–Sept. 10, 1937 | Oct. 1 | Nov. 11 | 7 | 3 | 5 | 11 |
| 11—H. P. | do | M | 26 | Clerk | June 1–June 8, 1936 | July 15 | Nov. 15 | 6 | 5 | 5 | 23 |
| 12—J. N. | Jan. 1937 | M | 21 | Student | Aug. 1–Aug. 23, 1937 | Sept. 30 | Nov. 19 | 9 | 5 | 7 | 14.5 |
| 13—J. H. | Mar. 1937 | M | 47 | Fur salesman | July 11–July 25, 1937 | Oct. 30 | Dec. 15 | 16 | 14 | 15 | 22 |
| 14—E. K. | Apr. 1937 | F | 41 | Housewife | Aug. 1–Aug. 25, 1937 | Mar. 8 | Mar. 8 | 31 | 28 | 29.5 | 29.5 |
| 15—H. B. | Sept. 1937 | M | 28 | Advertising | July 10–July 31, 1937 | Aug. 19 | Sept. 11 | 6 | 3 | 4.5 | 7.5 |
| 16—L. M. | Oct. 1937 | F | 55 | Housewife | July 2–July 8, 1937 | July 23 | Sept. 13 | 3 | 2 | 2.5 | 10 |
| 17—M. B. | do | F | 51 | Clerk | Aug. 8–Aug. 15, 1937 | Oct. 3 | Oct. 3 | 8 | 7 | 7.5 | 7.5 |

cases in which the calculated minimum incubation periods fall within the first month, nine within the second, two within the third, three within the fourth, and one within the seventh. When estimated to the onset of the severer symptoms, there was one of the 17 cases in which the minimum interval was less than 1 month; in only four was it less than 2 months. Thus the evidence points to a much more prolonged incubation period than has generally been supposed.

The validity of any conclusion in this study rests upon the question whether the infection in these cases was acquired within the city or actually during periods while the patients were outside. In all the cases the epidemiological evidence is clear as to the exclusive use of pasteurized dairy products in New York City and freedom from hazardous occupational contacts. All the patients had been out of the city and most of them knew that they had used raw milk; the others had been in places beyond easy reach of pasteurized products and presumably had been served raw milk. Further, the duration of the out-of-town visit was in no case less than 6 days and in four cases it was over 1 month. There was therefore a substantial period of known or probable exposure followed by one with almost certainly no exposure. The probability of acquiring the infecting organisms during the later rather than the earlier interval seems clearly to be very remote.

The seasonal distribution of cases in New York City residents provides further evidence as to the probable origin of these infections. If the trips out of the city were unrelated events, the seasonal distribution of the New York City cases would probably conform to that noted elsewhere, that is, they would be scattered generally throughout the year but with some increase during the spring and summer. The marked variation from this is indicated in table 2. There was a concentration in the fall months of the dates of onset—34 of the 46 patients becoming ill in the 5 months, August to December, inclusive. These cases gradually became diagnosed and reported. All but 7 of the 46 cases were reported in the months October to March. This reversal in the usual seasonal distribution differentiates these cases from those among persons more or less continuously exposed. The observations are adequately explained by the assumption that these are infections acquired chiefly during the summer months, when people "go to the country," and become manifest after prolonged incubation periods.

The variety of organisms involved in these cases is indicated only by the epidemiological findings. With two exceptions, these were infections acquired in vacation territories in the northeast, localities where *Brucella* infection of animals is rare except in cattle. Further, these visitors to the country would have no hazardous exposures to swine even if the *Br. suis* infection did exist. Goats and *Br. melitensis*

infection are even rarer. Despite the lack of bacteriological confirmation, the conclusion appears warranted that the cases under consideration are *Br. abortus* (bovine) infections.

TABLE 2.—*Seasonal distribution of undulant fever among New York City residents* [1]

| Quarter | By month of report | | | By month of onset | | |
|---|---|---|---|---|---|---|
| | New York City | | United States [2] | New York City | | Iowa [3] |
| | Number | Percent | Percent | Number | Percent | Percent |
| January–March | 16 | 34.8 | 18.0 | 6 | 13.0 | 23.7 |
| April–June | 4 | 8.7 | 26.9 | 3 | 6.5 | 28.3 |
| July–September | 3 | 6.5 | 30.3 | 13 | 28.3 | 28.6 |
| October–December | 23 | 50.0 | 24.8 | 24 | 52.2 | 19.4 |
| Total | 46 | 100.0 | 100.0 | 46 | 100.0 | 100.0 |

[1] In 6 cases 1 or both of these dates were not stated.
[2] Based on 10,492 cases reported to Public Health Service, 1929–35.
[3] Based on 1,067 cases studied in Iowa, 1928–35.

## DISCUSSION

Heretofore the evidence concerning the incubation period in undulant fever has been gathered chiefly in the Mediterranean region and in experimental laboratories. It was noted in the garrisons in Malta that soldiers recently arrived developed the fever as early as the latter part of the first week of residence there. Thus minimum incubation periods could be measured. Average intervals could not be obtained in the same situation; nevertheless, the usual incubation period has been variously stated as ranging about 14 days with extreme limits of 3 to 20 days or possibly more. It was recognized by some and disputed by others that a more prolonged period might occur.

The famous case of the steamship *Joshua Nicholson*, which sailed with a cargo of 65 goats from Malta on August 19, 1905, gives striking evidence relative to the time relationships of beginning exposure and onset of symptoms (*1*). During the voyage of this vessel to Antwerp the goats' milk was used freely by 8 of the 12 men who manned the vessel. All of these 8 men became ill between 18 and 34 days after the loading at Malta, and 4 to 20 days after unloading at Antwerp. More recently, Rainsford (*2*) has presented evidence as to the minimum incubation periods in three cases contracted at Malta. These periods were 42 days, 20 days, and 39 days.

Experimental inoculation of human volunteers with *Brucellae* has been carried out by Morales-Otero (*3*). Exposures were made by feeding, and by applications to the normal and abraded skin. Nine out of forty volunteers developed clinical evidence of undulant fever, and a tenth possibly suffered from an atypical infection. The incu-

bation periods measured from the earliest symptoms are indicated in table 3. The volunteers were observed in hospital, hence the calculated incubation periods indicate the interval from exposure to the beginning of the prodrome. There was only one *Br. abortus* infection following ingestion of massive doses of the organism. The recorded incubation period was 10 to 17 days, but to earliest symptoms which would ordinarily be given attention the interval was 28 to 35 days.

TABLE 3.—*The incubation period in experimentally induced undulant fever*

[From the study of P. Morales-Otero (5)]

| Case No. | Variety of *Brucella* | Nature of exposure | Date of exposure | Date of earliest symptoms | Incubation period in days |
|---|---|---|---|---|---|
| II | *abortus* | Abraded skin | Feb. 10 | Feb. 20 | 10 |
| VII | *suis* | Ingestion | July 23 and Aug. 9 | Aug. 27 | 17 or 34 |
| VIII | *suis* | Abraded skin | Feb. 10 | Feb. 20 | 10 |
| XVII | *abortus* | do | do | Feb. 20 | 20 |
| XIX | *melitensis* | Ingestion | Feb. 17 | Feb. 23 | [1] 10 |
| XX | *melitensis* | Abraded skin | Feb. 10 | Feb. 26 | 16 |
| XXIII | *suis* | do | do | Feb. 21 | 11 |
| XXXVIII | *suis* | Ingestion | Daily from Aug. 26 to Aug. 30 | Sept. 7 | 8–12 |
| XL | *abortus* | do | Daily from May 1 to May 7 | May 17 | 10–17 |

[1] The period here was possibly 6 days, but it was stated in the case report that the patient continued well until 10 days after inoculation.

There is evidence, therefore, that the incubation period in undulant fever varies widely. The disease may develop rapidly following exposure to the more virulent *Br. melitensis*. The cases reported here indicate, however, that following the ingestion of the less virulent *Br. abortus*, illness may manifest itself only after relatively prolonged periods. Sufficient data are not available to reveal the incubation period in *Br. suis* infection or following skin inoculation with any variety, but limited information suggests that these periods may be short. It is clear, however, that in interpreting findings and in accumulating data, due consideration must be given to the variety of *Brucella* involved, the method of inoculation, and dosage of infecting organisms. It is also evident that we must explore sources quite remote in time from the reported date of onset if we are dealing with undulant fever presumably acquired through the use of raw cow's milk.

## SUMMARY

Residents of the city of New York, with few exceptions, are exposed to brucellosis only when visiting beyond the metropolitan area.

Seventeen cases are presented in which the individuals are believed to have been exposed to this infection through the use of raw cow's milk consumed during single out-of-town visits of 6 days to 11 weeks' duration.

The incubation periods were found to vary widely—from 1 week to not less than 4 months, with average intervals much more prolonged

than those for *Br. melitensis* infections as ordinarily stated in the literature.

A method is indicated of assembling the data needed to provide more precise knowledge concerning the incubation period in naturally acquired *Br. abortus* infections.

It is suggested that the wide range in incubation periods in undulant fever is accounted for in part by the variations in virulence of the three varieties of *Brucella*, by the different modes of inoculation, and probably by variation in the dosage of infecting organisms.

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## DERATIZATION ACTIVITIES IN PORTS AND ON SHIPS IN AMERICAN COUNTRIES DURING 1936 [1]

From information prepared by the Office International d'Hygiene publique, with comments by C. L. WILLIAMS, *Assistant Surgeon General*, and B. J. LLOYD, *Assistant to the Director, Pan American Sanitary Bureau; Medical Director (Retired), United States Public Health Service*

INTRODUCTION

Since 1931 the International Office of Public Health, in fulfillment of articles 6, 25, and 28 of the International Sanitary Convention signed at Paris June 21, 1926, has published each year a "Summary of reports received concerning the destruction of rats in ports and on board ships, the deratization of ships, and the issuing of certificates of deratization and of exemption from deratization."

The sixth of these summaries appeared recently. It contains the reports for the year 1936 and furnishes information on more than 100 countries or colonies scattered throughout the world. It has been considered of interest to extract from the summary the data referring to the American continent.

The American countries for which information is given are as follows: Antigua (Leeward Islands), Argentina, Bahamas, Barbados, Bermuda, Brazil, British Guiana, Canada, Chile, Colombia, Curaçao, Ecuador, Salvador, Falkland Islands, French Guiana, Grenada (Windward Islands), Guadeloupe, Haiti, Hawaiian Islands, Jamaica, Martinique, Panama (Canal Zone), Paraguay, Peru, Philippine Islands, Puerto Rico, St. Pierre et Miquelon, Saint Vincent, Saint Lucia,

[1] Translation. This article will appear, in French, in the Boletín de la Oficina Sanitaria Panamericana for June 1938, issued by the Pan American Sanitary Bureau, Washington, D. C.

Trinidad, United States, Uruguay, Venezuela and Virgin Islands. In all, data are given for 34 countries or colonies, including the noncontiguous colonies under American protectorate or control—the Territory of Hawaii and the Philippine Islands.

Five other colonies or countries of America not included in the present summary—the Republics of Costa Rica, Cuba, Guatemala, Mexico, and the colony of British Honduras—have, on former occasions in the last six years, furnished information to the International Office in regard to the campaign against rats. Costa Rica, in 1932, and Guatemala and British Honduras, in 1934, reported that, as plague had not been present in their territories for a considerable time, no campaign of deratization was being carried out, and no service of deratization existed in their ports.

The report from Cuba for 1936 arrived too late to be included, but the data may be summarized as follows: In 1936, 53 ships were deratized, but because the boats were often fumigated with full holds, or left the port soon after the process, investigations could not be carried out except on 9 ships, in which 47 rats were discovered; 53 certificates of fumigation and 48 of exemption were given. Two ships were deratized before unloading, and numerous insects and some rats were found. No case of rat plague was reported.

The latest reports received from Mexico are for 1934. In the 9 principal ports of the country, 107,328 rats were captured and none was found to be plague-infected; 253 ships were fumigated with hydrocyanic acid gas in the 9 ports, and in 3 of the ports 357 rats were killed by fumigation aboard ship; none was found infected. During the year, 427 certificates of deratization were issued, 253 following the international form, and the remainder no doubt on a local form.[2]

### ON SHORE DERATIZATION IN THE PORTS

No systematic deratization is carried out in Antigua, Curaçao, Falkland Islands (Port Stanley), Guadeloupe (Pointe-a-Pitre), British Guiana (Georgetown), French Guiana, Saint Pierre et Miquelon, or Salvador; consequently no data were available regarding the number of rats, and species, destroyed in these countries.

In the 13 principal ports of Argentina, 69,605 rats were destroyed, as compared with 72,291 in 1935, and 41,921 rats were examined, as compared with 32,092 in 1935. Seven rats captured in Buenos Aires in 1936 were found to be plague-infected, while 17 were so found in 1935 (15 in Santa Fe and 2 in Bahia Blanca). As to species, *Epimys* [*Mus*] *decumanus* [*R. norvegicus*(?)] was most numerous in Buenos Aires (8,834 as against 4,175 *R. rattus* and 3,153 *R. alexandrinus*); while in Rosario, *alexandrinus* was first (1,995 as compared

[2] In 1936, 169,708 rats were captured in the ports in anti-plague work. (Pan American Sanitary Bureau.)

with 1,305 *decumanus* and 933 *rattus*). In Santa Fe, Bahia Blanca, and La Plata, almost all the rats were *decumanus*.

In the Bahamas, 10 rats were destroyed at Nassau; 2,485 (*norvegicus* and *rattus*) at Bridgetown, Barbados, and in the Bermudas, 1,650. No plague-infected rats were found.

The only data for Brazil covering the entire year 1936 are for Rio de Janeiro, but since September 1, 1936, São Salvador (Bahia), Recife, and Fortaleza [3] have systematic reports of deratization, so that beginning with 1937 complete information will be available for six ports of this important country. In the port of Rio de Janeiro, 301 rats were destroyed in 1936, as compared with 348 in 1935; while in the city, 64,086 rats were killed in 1936. During the last four months of the year, 2,872 rats were destroyed in the city of São Salvador, 5,165 in Recife, and 3,729 in Fortaleza. No plague rats were found.

In the ports of Canada the port commissioners and private parties undertake the destruction of rats. Although port supervision is in the hands of the quarantine agents of the Federal service, statistics are not available as to the rats destroyed and examined.

In the four principal ports of Chile, 62,245 rats were destroyed in 1936; practically all of them were examined, and no plague infection was found. In the Republic of Colombia, during the second half of 1936, 18,118 rats were destroyed. This country reports that, because of the danger from continuous recrudescences of plague in a neighboring country, the National Department of Health is planning to organize soon, in the ports of the Republic, a campaign of deratization based on the most modern principles.

In the Republic of Ecuador, 58,032 rats were examined in Guayaquil, of which 50 were found to be plague-infected.

In the United States, 126,302 rats were destroyed in the 7 ports of New York, New Orleans, Mobile, Los Angeles, Oakland, San Francisco, and Seattle; 87,121 were examined and none was found plague-infected. In Hawaii, 216,623 rats were destroyed, nearly all were examined, and 26 were found plague-infected (23 plague rats on the Island of Hawaii and 3 on Maui). In the Philippines, 52,076 rats were captured at Manila, and in Puerto Rico, 5,533 rats at San Juan.

On the Island of Grenada (Windward Islands), 2,647 rats were destroyed in the port of St. George, and in Haiti, 410 rats captured at Port-au-Prince were examined. In Kingston, Jamaica, 1,413 rats, belonging to the species *R. norvegicus* and *rattus*, were destroyed. At Fort-de-France (Martinique), 13,353 rats were trapped. None was found plague-infected, which is not surprising, as it has been a long time since plague disappeared from the Antilles.

[3] Maceio and Santos are also sending reports on rat work. (Pan American Sanitary Bureau.)

In Paraguay, 4,411 rats were destroyed in the city of Asuncion; in Peru, in the six principal ports, 21,007 rats were killed, of which 28 were found plague-infected (19 from Callao, 6 from Salaverry, 3 from Pacasmayo).

In the Windward Islands, 434 rats were destroyed at Kingstown (St. Vincent), and 4,101 (*R. rattus*) at Port-Castries (St. Lucia). In Trinidad, 10,892 rats were captured (8,252 *decumanus* and 2,640 *rattus*).

In Uruguay, 628 rats were destroyed in the port of Montevideo; and in Venezuela, 862 rats were examined in the three large ports and 7,106 at Caracas. No plague-infected rats were found.

### SHIPS DERATIZED

No ships were deratized in the ports of the following American countries: Antigua, Bermuda, Falkland Islands, Grenada, Guadeloupe, French Guiana, Haiti, St. Pierre et Miquelon, St. Vincent, St. Lucia, Salvador. No information on this matter was received from Colombia, Ecuador, and Venezuela.

TABLE 1.—*Number of vessels deratized and procedure employed, 1935 and 1936*

| Country | Number of vessels deratized | | Procedure employed, 1936 | |
|---|---|---|---|---|
| | 1936 | 1935 | Sulfurous anhydride or sulfur | Hydrocyanic acid gas |
| Argentina | 3,968 | 3,854 | 1,369 | 2,599 |
| Bahama Islands | 5 | 2 | 5 | |
| Barbados | 67 | 66 | 67 | |
| Brazil (Rio de Janeiro) | 220 | 221 | 159 | 61 |
| British Guiana | 1 | | | |
| Canada [1] | 121 | 93 | 4 | 117 |
| Chile | 66 | 74 | 2 | 64 |
| Cuba | 53 | 130 | | |
| Curaçao | 17 | 18 | | 17 |
| Hawaiian Islands [2] | 12 | 18 | | 12 |
| Jamaica | 27 | 35 | | 27 |
| Martinique | 4 | 8 | 4 | |
| Panama Canal Zone [2] | 67 | 48 | | 67 |
| Peru | 118 | 113 | 10 | 108 |
| Philippine Islands [2] | 345 | 360 | 288 | 57 |
| Puerto Rico [2] | 6 | 14 | | 6 |
| Trinidad | 4 | | 4 | |
| United States [2] | 810 | 726 | 19 | 791 |
| Uruguay | 5 | | | |
| Virgin Islands [2] | 11 | 21 | 11 | |
| Total | 5,927 | 5,800 | 1,942 | 3,926 |

[1] Apr. 1, 1936–Mar. 31, 1937, and Apr. 1, 1935–Mar. 31, 1936.
[2] July 1, 1935–June 30, 1936, and July 1, 1934–June 30, 1935.

As shown in table 1, hydrocyanic acid is used throughout America twice as much as sulfur and its derivatives. It is generally preferred; and, of late, in some countries (Canal Zone, Hawaii, Puerto Rico, Jamaica) it is even the only method used; whereas in the old European

possessions in the Antilles (Barbados, Martinique, Trinidad, and the Virgin Islands) sulfur is exclusively used. It should be noted that in the Philippine Islands, as in the Orient and Far East, sulfur deratization is still in favor.

### DERATIZATION ON BOARD SHIP

None of the rats destroyed on board ship through fumigation in American ports was found plague-infected. In Argentina, 5,890 rats were destroyed by the fumigation of ships in 1936, as compared with 6,830 in 1935. In 1936, 375 of these rats were killed before fumigation, and 5,517 were found dead after fumigation. In the Bahama Islands, 8 rats were destroyed aboard ship by fumigation; in Barbados, 81; Brazil (Rio de Janeiro), 685; Canada, 708 rats and 246 mice; Chile, 1,211 rats; Curaçao, 120; United States, 4,562; Canal Zone, 198; Philippine Islands, 1,081; Puerto Rico, 23; Virgin Islands, 2; Jamaica, 139; Martinique, 136; Peru (Callao), 552

### CERTIFICATES OF DERATIZATION AND EXEMPTION FROM DERATIZATION

Under the terms of article 28 of the International Sanitary Convention of 1926, all ships, except those in the national coasting trade, should be periodically deratized or else maintained permanently in such condition that the rat population is at a minimum. They will receive, in the former case, certificates of deratization, and in the latter, certificates of exemption from deratization.

Certificates of deratization or of exemption are issued exclusively by the health authorities of the ports which the respective Governments have reported to the Office International d'Hygiène publique as having the equipment and personnel necessary for the deratization of ships.[4]

The duration of the validity of these certificates is 6 months; sometimes, however, an additional month is allowed for free ships to regain their home ports.

In 1936 no certificate, either of deratization or of exemption, was issued in the following countries:[5] Antigua, Barbados, Falkland Islands, Grenada, Guadeloupe, French Guiana, Haiti, St. Pierre et Miquelon, St. Vincent, St. Lucia, Salvador, Uruguay. In the last-named country, although 5 ships were deratized at Montevideo, no certificate was issued, the port of Montevideo not being qualified to issue certificates. No information on this subject was received

[4] Each year the Office International d'Hygiène publique publishes the list to date of ports which the participating Governments (and even the nonparticipating, in certain useful cases) have designated as qualified for such purpose. The latest list, No. 10, gives all such data received up to November 15, 1937.

[5] To this list must be added Costa Rica, Guatemala, and British Honduras, which have no deratization service.

from Colombia, Ecuador, Paraguay, and Venezuela. In the other American countries [6] certificates were issued as follows:

TABLE 2.—*Numbers of certificates of deratization and of exemption issued by certain American countries in 1936*

| Country | Number of certificates issued | |
|---|---|---|
| | Deratization | Exemption |
| Argentina | 3,968 | 42 |
| Bahamas | 5 | |
| Bermuda | | 1 |
| Brazil (Rio de Janeiro) | 220 | 58 |
| British Guiana | 1 | |
| Canada [1] [2] | 121 | 266 |
| Chile | 66 | 41 |
| Curaçao | 16 | 44 |
| Hawaiian Islands [3] | 12 | 3 |
| Jamaica | 27 | |
| Martinique | 4 | |
| Panama Canal Zone [3] | 67 | 7 |
| Peru | 118 | |
| Philippine Islands [3] | 345 | 14 |
| Puerto Rico [3] | 6 | 25 |
| Trinidad | 2 | 2 |
| United States [3] | 810 | 1,802 |
| Virgin Islands [3] | 11 | 4 |
| Total, 18 American countries | 5,799 | 2,309 |
| Total, 50 other countries in summary | 9,434 | 12,929 |
| Total for the 68 countries in summary | 15,233 | 15,238 |

[1] In Canada 76 extensions of validity were accorded to certificates after inspection of the ships concerned.
[2] Apr. 1, 1936–Mar. 31, 1937.
[3] July 1, 1935–June 30, 1936.

As may be seen from table 2, there were issued in 1936, in American countries, almost three certificates of deratization for each exemption certificate, while in the 68 countries throughout the world covered in this research there were, during the same year, practically the same number of exempted and deratized ships. At first sight it would seem that the rat index of ships traveling in American waters is three times higher than the average index for world ships, and four times as high as the index for 50 non-American countries. It is seen that this conclusion is not justified, however, if one sets aside the figures for the Argentine Republic where, undoubtedly because of the nature of the cargoes (cereals) loaded there for Europe, the merchant fleet must comprise a high number of old boats in which the rat population multiplies easily. This is, at least, the only clear reason coming to mind to explain why this country has such an unusual number of deratizations (3,968) as compared with exemptions (42). Aside from Argentina, it will be seen that the United States issues approximately

[6] The numbers of certificates issued in Cuba in 1936 were 53 of deratization and 48 of exemption; and in Mexico in 1934, 427 certificates of deratization were issued.

twice as many certificates of exemption (1,802) as of deratization (810); the same condition obtains in Canada (121 deratizations per 266 exemptions), whereas in the Asiatic American possessions (the Hawaiian and Philippine Islands), the number of deratizations greatly exceeds the number of exemptions, 12 to 3 in Hawaii and 345 to 14 in the Philippines. These figures conform to those of other countries in those regions.

### SHIPS DERATIZED BEFORE UNLOADING CARGO

In wording the articles concerning the deratization of ships in the case of plague, the International Sanitary Conference of 1926 felt that a satisfactory result would seldom be obtained unless the operation should be carried on after unloading, but cases have been reported to the Permanent Committee of the International Office in which the unloading of ships carrying plague rats, especially when the cargo consists of grain, proves difficult to carry out without risk to the personnel employed in unloading and without real danger of infected rats reaching the land. Consequently the quarantine commission of the permanent committee has decided that the fumigation of a ship before, or during, the unloading may be in certain cases useful and even necessary to public health. However, in principle, a fumigation carried out before unloading should not be used as the basis for the issuing of a certificate of deratization unless a careful inspection of the ship after unloading shows that the results were entirely satisfactory. Otherwise a second deratization should be carried out with empty holds.

In America, only two countries during the year in question reported deratizations of ships before unloading. They are Canada (April 1, 1936–March 31, 1937) and the United States (July 1, 1935–June 30, 1936).[7] In Canada 31 boats were fumigated before unloading (of which 14 at Halifax, 7 at Saint John, 8 at Vancouver). Following fumigation, in all, 26 rats were found (24 at Vancouver). In the United States, 403 ships were fumigated before unloading (of which 14 at Angel Island; 27 at Baltimore; 56 at Boston; 22 at Jacksonville; 67 at Los Angeles; 29 at Marcus Hook; 31 at New Orleans; and 139 at New York). In all, 2,377 rats were found (1,030 in the 139 ships at New York; 468 in the 31 at New Orleans; 274 in the 29 at Marcus Hook; 257 in the 67 at Los Angeles; 170 in the 27 at Baltimore; 74 in the 56 at Boston; 58 in the 22 at Jacksonville; and 39 in the 14 ships at Angel Island). None of these rats was plague-infected.

[7] Also 2 ships in Cuba were fumigated before unloading.

The summary presents a table showing the number of plague rats found in 1936, and is reproduced here in its essentials in table 3:

TABLE 3.—*Plague rats found in ports and on ships in 1936*

| Country | Port | Number of plague rats reported | Remarks |
|---|---|---|---|
| | A. Ports and maritime cities | | |
| Algeria | Algiers | 56 | *Suspected:* 51 in city, 5 on the quays. |
| | Oran | 1 | *Suspected:* in the city. |
| Argentina | Buenos Aires | 7 | In 1935, 17 plague rats; 15 at Santa Fe, and 2 at Bahia Blanca. |
| British India and Burma | Bassein | 4 | Also in the city at Rangoon, 15 plague rats. |
| Ceylon | Colombo | 8 | In the city, 39 plague rats. |
| Ecuador | Guayaquil | 50 | |
| France | Marseille | 7 | All in the city. |
| Hawaiian Islands | Hawaii Island | 23 | |
| | Maui Island | 3 | |
| Iraq | Baghdad | 9 | |
| Peru | Salaverry | 6 | |
| | Pacasmayo | 3 | |
| | Callao | 19 | |
| Tunisia | Tunis | 34 | In 1935, 11 plague rats at Tunis. |
| Total | | 230 | |
| | B. On ships | | |
| England | Liverpool | 4 | From a grain-laden vessel. |

If there are added to this total the number of rats captured in the city in Colombo and Rangoon and found plague-infected (54), the total number of rats found plague-infected in ports in 1936 is 284, as compared with 435 in 1935, 401 in 1934, 721 in 1933, 864 in 1932, and 978 in 1931.

## CONCLUSION

As these summaries continue to appear (the health authorities of more than 100 countries sending in the information requested), the idea that practical results may be obtained from the campaign against rats in ports and on board ship becomes increasingly justified. Two interesting facts appear from these 6 years of study: The first is that the number of plague rats in ports has been reduced approximately 75 percent in 6 years, decreasing from 978 in 1931 to 284 in 1936. The second is that sanitary conditions are rapidly improving on the ships constituting the merchant fleet of the world. In 1936 the number of certificates of exemption from deratization surpassed for the first time the number of certificates of deratization (15,238 against 15,233); whereas in 1931, the first year in which a summary of this information was issued, there were no more than 9,273 certificates of exemption (4,319 in England and 1,923 in the United States) as against 13,634 certificates of deratization.

These two facts, one relating to the number of plague rats found in ports, and the other to the number of exemption certificates as

compared with the number of deratization certificates, permit one to state that the sanitary condition, both of ports and ships, has improved greatly, thanks to the ceaseless efforts of the maritime health authorities of practically all the countries in the world in this campaign against rat infestation.

## Comment

By Bolivar J. Lloyd, *Assistant to the Director, Pan American Sanitary Bureau, Medical Director (Retired), United States Public Health Service*

In the very interesting summary of deratization activities prepared by the International Office of Public Health, of Paris, attention is called to the fact that in American countries about three deratization certificates are given for each exemption certificate, while in the entire group of 68 countries reporting on this subject to the Office International d'Hygiène publique, there were, during the same year, practically the same number of ships deratized as were given certificates of exemption. The article further calls attention to the fact that in Argentina the disproportion between the number of deratization certificates and the number of certificates of exemption was far greater than in any other country in the entire group (3,968 deratizations to 42 exemptions, a ratio of approximately 94 to 1). It is inferred that the merchant ships which call at Argentine ports are probably old vessels in which rats multiply easily, and that many of these vessels carry large quantities of grain, a cargo that always attracts great numbers of rats. The author infers that these two factors are the cause of the abnormally high proportion of deratizations as against exemptions in Argentina.

It is suggested that these inferences or generalizations are perhaps based upon incomplete evidence, but more especially upon failure to classify the vessels fumigated into (*a*) those from foreign ports and (*b*) those plying between ports in the Republic of Argentina. The importance of such classification will be seen at once when we observe the relatively small number of vessels from foreign ports as compared with domestic vessels and the disproportionately large numbers of rats obtained from vessels from foreign ports, as a rule. The additional data given here are from official reports.

Of 163 vessels from foreign ports inspected in Argentina during 1935, 97 were fumigated, 53 were exempted, and 13 were granted extensions by the Argentine authorities. During the same period 3,757 domestic vessels were fumigated. Of the 97 foreign vessels fumigated, 52 had certificates of exemption or of fumigation issued within the preceding 6 months (*1*). It may be assumed that the relative proportion of foreign to domestic vessels was approximately the same in 1936 and 1937 as in the year 1935. In the accompanying

table it will be observed that occasionally a ship was fumigated in an Argentine port and after a lapse of several months the vessel was again fumigated in Argentina. This means that the vessel made an outward voyage and was not again fumigated until it returned to Argentina.

*Foreign vessels fumigated in ports of the Republic of Argentina though possessing certificates of fumigation or exemption issued within the preceding 6-month period. (Translation; slightly abridged.)*

| Name and nationality of vessel | Place of last previous fumigation or exemption, and method of fumigation. | | Time elapsed since last fumigated or exempted | | Rats recovered before and after fumigation (fumigation in Argentina) | |
|---|---|---|---|---|---|---|
| | | | Months | Days | Before | After |
| *1935* | | | | | | |
| British "$S_1$"[1] | Calcutta | Exemption | 2 | 22 | | 228 |
| Italian "$V_1$" | Newport | do | 1 | 20 | | 16 |
| British "$N_1$" | Calcutta | do | 2 | 19 | 13 | 115 |
| Dutch "$B_1$" | Havre | do | 5 | 19 | | 32 |
| Belgian "$B_2$" | Antwerp | Cyanide | 2 | 5 | 9 | 52 |
| French "$E_1$" | Cardiff | Sulfur | 4 | 23 | | 180 |
| British "$B_3$" | London | Exemption | 4 | 24 | 15 | 39 |
| Brazilian "$J_1$" | Rio de Janeiro | Sulfur | 3 | 11 | 23 | 30 |
| Greek, "$P_1$" | Antwerp | Exemption | 2 | | | 7 |
| Finnish "$R_1$" | Rouen | do | 5 | 22 | 19 | 32 |
| Greek "$Z_1$" | Barry | do | 2 | 14 | | 30 |
| British "$L_1$" | do | Sulfur | 4 | 12 | 3 | 24 |
| French "$C_1$" | Antwerp | Exemption | 1 | 14 | | 82 |
| Danish "$A_1$" | Copenhagen | do | 5 | 5 | | 154 |
| Greek "$A_2$" | Kiel | do | 1 | 27 | 11 | 90 |
| Jugoslav "$P_2$" | Barry | Sulfur | 2 | 3 | | 54 |
| Greek "$N_2$" | Cardiff | Exemption | 1 | 18 | | 47 |
| British "$S_2$" | Antwerp | Cyanide | 3 | 14 | | 15 |
| Greek "$F_1$" | Piraeus | Sulfur | 2 | 23 | 7 | 6 |
| Greek "$D_1$" | do | do | 2 | 2 | | 45 |
| Finnish "$A_2$" | Danzig | Exemption | 1 | 15 | 19 | 22 |
| German "$E_2$" | Hamburg | Sulfur | 1 | 11 | 18 | 170 |
| Jugoslav "$P_3$" | New York | Cyanide | 5 | 4 | 8 | 55 |
| Swedish "$T_1$" | Rio de Janeiro | Sulfur | 1 | 10 | | 51 |
| British "U" | Swansea | do | 2 | 4 | | 45 |
| Belgian "$M_1$" | Antwerp | Cyanide | 3 | 17 | | 5 |
| English "$R_2$" | Cardiff | Sulfur | 1 | 6 | 11 | 28 |
| Finnish "$R_1$" | Buenos Aires | do | 4 | 23 | | 68 |
| Brazilian "$A_4$" | Rio de Janeiro | do | 3 | 19 | | 41 |
| Spanish "$A_3$" | Barry | Exemption | 4 | 25 | | 246 |
| British "$R_3$" | Rotterdam | do | 3 | 5 | | 27 |
| British "$G_1$" | Galveston | Cyanide | 4 | | 10 | 46 |
| Jugoslav "$L_2$" | Barry | Exemption | 5 | 5 | 3 | 52 |
| Greek "$N_3$" | Cardiff | do | 4 | 3 | | 61 |
| Belgian "$H_1$" | Antwerp | Cyanide | 2 | 3 | 8 | 68 |
| Greek "$T_2$" | Buenos Aires | do | 2 | 3 | 9 | 51 |
| British "$L_3$" | Tyne | Sulfur | 4 | 16 | | 68 |
| German "$L_4$" | Hamburg | do | 2 | 14 | 13 | 32 |
| Greek "$G_2$" | Buenos Aires | do | 4 | 21 | | 34 |
| British "$L_3$" | Cardiff | Exemption | 4 | 18 | | 3 |
| Argentine "$J_2$" | Buenos Aires | Cyanide | 5 | 7 | 6 | 18 |
| Greek "$Z_2$" | Antwerp | do | 2 | | | 4 |
| Greek "$N_4$" | Rio de Janeiro | Sulfur | 4 | | | 46 |
| British "$G_2$" | Cardiff | Exemption | 1 | 24 | | 24 |
| Swedish "$V_3$" | Goteburg | Cyanide | 1 | 16 | 9 | 58 |
| Greek "$A_5$" | Piraeus | Sulfur | 3 | 23 | 1 | 40 |
| Brazilian "$C_2$" | Rio de Janeiro | Cyanide | 4 | 17 | 12 | 40 |
| French "$C_1$" | Bahia Blanca | do | 5 | 19 | | 79 |
| Dutch "$A_7$" | Cardiff | Exemption | 1 | 3 | | 43 |
| Greek "$E_3$" | Copenhagen | do | 2 | 1 | 5 | 28 |
| British "$O_1$" | Barry | do | 5 | 10 | | 33 |
| British "$P_4$" | Swansea | do | 3 | 14 | 1 | 9 |
| Danish "$A_1$" | Bahia Blanca | Fumigation | 5 | 27 | | 154 |
| French "$C_1$" | do | do | 5 | 19 | | 75 |

*Foreign vessels fumigated in ports of the Republic of Argentina though possessing certificates of fumigation or exemption issued within the preceding 6-month period. (Translation; slightly abridged.)*—Continued.

| Name and nationality of vessel | Place of last previous fumigation or exemption, and method of fumigation. | | Time elapsed since last fumigated or exempted | | Rats recovered before and after fumigation (fumigation in Argentina) | |
|---|---|---|---|---|---|---|
| | | | Months | Days | Before | After |
| *1936* (Incomplete) | | | | | | |
| French "$P_5$"—— | Antwerp | Fumigating | 1 | | | 56 |
| Dutch "$W_1$"—— | Amsterdam | do | 3 | 5 | | 83 |
| Greek "$T_3$"—— | Havre | do | 2 | 7 | | 166 |
| German "$P_6$"—— | Hamburg | Exemption | | | | 28 |
| German "$P_7$"—— | do | Fumigation | 2 | 4 | | 40 |
| French "$P_8$"—— | Antwerp | do | 1 | | | 30 |
| Danish "$A_1$"—— | Buenos Aires | do | 3 | 31 | | 170 |
| Finnish "$A_2$"—— | Kotka (Fin.) | Exemption | 1 | 13 | | 59 |
| Greek "$G_2$"—— | Genoa | Fumigation | 4 | | | 107 |
| German "$W_2$"—— | Hamburg | Exemption | 1 | 20 | | 33 |
| —— "$N_3$"—— | Barry Dock | Sulfur | 4 | 3 | | 111 |
| Greek "$I_1$"—— | Enden | Exemption | | | | 57 |
| British "$O_2$"—— | Cardiff | Fumigation | 1 | 9 | | 34 |
| British "$M_2$"—— | do | do | 1 | 3 | | 34 |
| British "$R_4$"—— | do | do | 1 | | 12 | 53 |
| Spanish "$A_3$"—— | Newport Mon | Exemption | 1 | 5 | | 34 |
| British "$H_2$"—— | do | Fumigation | 1 | 20 | | 29 |
| —— "$J_3$"—— | Swansea | Exemption | 2 | 9 | 7 | 45 |
| Jugoslav "$M_3$"—— | Antwerp | do | 5 | | 8 | 71 |
| —— "$C_2$"—— | Rio de Janeiro | Fumigation | 2 | 8 | [3] 11 | 76 |
| Jugoslav "$I_3$"—— | Antwerp | Exemption | | | 2 | 27 |
| *1937* (Incomplete) | | | | | | |
| Brazilian "$D_2$"—— | Rio de Janeiro | Fumigation | 5 | 11 | 14 | 304 |
| Greek "$F_2$"—— | Antwerp | do | 3 | 11 | | 57 |
| British "$S_3$"—— | Bordeaux | Exemption | 1 | 24 | 3 | 47 |
| Greek "K"—— | Amsterdam | do | 2 | 2 | 16 | 147 |
| British "$N_6$"—— | Glasgow | Fumigation | 5 | 21 | | 75 |
| Spanish "$A_4$"—— | Bilbao | do | 1 | 30 | | 72 |
| Greek "$Z_1$"—— | Barry | Sulfur | 4 | 8 | | 77 |
| Greek "$P_9$"—— | do | Exemption | 1 | 13 | 6 | 81 |
| Norwegian "$V_3$"—— | Havre | do | 2 | | 12 | 68 |
| Finnish "$S_4$"—— | Stockholm | do | 1 | 6 | | 87 |
| Greek "$N_7$"—— | Barry | Sulfur | 1 | 19 | 6 | 48 |
| Jugoslav "$S_5$"—— | Helsingfors | Exemption | 2 | 9 | 5 | 48 |
| French "$M_4$"—— | Antwerp | Fumigation | 4 | | [3] 10 | 72 |
| British "$C_4$"—— | Rotterdam | do | 3 | 20 | 24 | 40 |
| Greek "$O_3$"—— | Constanza | Sulfur | 3 | 3 | | 108 |
| Brazilian "$B_4$"—— | New Orleans | Fumigation | 2 | 7 | 9 | 50 |

[1] The full name of the vessels may be found in the original (1).
[2] 8 young.
[3] 52 young.

Referring to the text of the report to the Office International d'Hygiène publique and also to the report of Dr. Sussini, Director of Health of Argentina for the year 1935 (*1*), it is possible to make the following analysis:

Of the 97 foreign vessels fumigated in Argentine ports in 1935, complete reports were made of 52, perhaps because they were heavily rat-infested notwithstanding their certificates. Of these 52, 23 possessed unexpired certificates of exemption, and on them 1,420 rats were found, or an average of 62 rats per vessel; 17 had been fumigated with sulfur within 6 months, and from these 960 rats

were obtained, or an average of 56 rats; 12 had been previously fumigated with cyanide within the period stated, and from these 491 rats were recovered, or an average of 41 rats per ship (*1*). In all, 2,871 rats were found on these 52 vessels, or an average of approximately 55 rats per vessel.

It remains now to inquire how many domestic vessels were fumigated and what was the average number of rats found per vessel on this class of ships as compared with vessels from foreign ports, assuming that these vessels were searched after fumigation in the same manner as were foreign ships. However, there were so many of these national vessels, and as they were fumigated every 3 to 6 months (*1*) regardless of whether there was evidence of rats on board or not, it would not be surprising to learn that it was not considered necessary always to search them after fumigation, a task involving no inconsiderable amount of work.

The report of the Office International states that an aggregate of 3,854 vessels were fumigated in Argentina during 1935, from which 6,830 rats were obtained. Of 163 foreign vessels inspected (Dr. Sussini's report), 52 were fumigated and the number of rats reported (2,871); while 45 were fumigated and the numbers of rats found were included with those of the domestic vessels.[7] Subtracting the 2,871 rats found on the 52 known foreign vessels from the total of 6,830 rats found on all vessels, we have left 3,959 rats found on 3,757 domestic and 45 foreign ships, the rats of these latter not being accounted for separately. This makes a total of 3,802 vessels fumigated, mostly domestic, on which 3,959 rats were found, or an average of slightly more than 1 rat per vessel.

Only 21 foreign vessels were reported to the Pan American Sanitary Bureau as having been fumigated in Argentina in 1936, but only those that, despite having valid certificates, were heavily rat-infested, were reported to the Bureau. From these a total of 1,392 rats was recovered, or an average of 66 rats per vessel; 15 had been fumigated within 6 months, and 6 had certificates of exemption. No data are available with regard to domestic vessels for this year, other than as given in the report of the Office International d'Hygiène publique, in which all vessels fumigated are grouped together.

Now, if we exclude from our reckoning the 21 heavily infested ships of 1936 and their 1,392 rats, we have left 3,833 vessels (mostly domestic) from which 4,498 rats were obtained, or an average of approximately 1.2 rats per vessel for that year. We do not know how many of these 3,833 vessels were from foreign ports; we know that 42 vessels were exempted and, as domestic vessels were practically never exempted when the 3 or 6 months period had elapsed, it may be assumed

[7] In 1935, 53 foreign vessels exempted and 13 prorogued for 30 days (1).

that these 42 were foreign, making a total of 63 foreign vessels accounted for. There could not have been more than 100 or 125 additional.

For the period January 1 to July 31, 1937, 16 foreign vessels were reported to the Pan American Sanitary Bureau as having been fumigated in Argentine ports, from which 1,381 rats were recovered, or an average of 86 rats per vessel. Again no data are available for domestic vessels, nor is any statement made with regard to the number of foreign vessels fumigated but not reported.

Referring to vessels fumigated in Argentina in 1935 (*1*), Dr. Sussini, in his report to the Third Pan American Conference of National Directors of Health, made the following observations:

> Argentina is first among nations in the number of vessels fumigated in her ports because of the fact that all of our own (Argentine) ships are fumigated every 3 to 6 months without exception or exemption, the time varying according to whether sulfur or cyanide was used when the vessel was last fumigated.
>
> * * * The extensive investigations of vessels which we have carried out with the aim of determining their rat population have revealed to us that the number of rats harbored is much larger than one would suppose, in spite of the forward-looking provisions of sanitary conventions. * * *
>
> We attribute the present defective status of rodent-prevention work on board vessels not to the imperfection of the hygienic principles wisely codified in conventions and in the sanitary regulations in force in various countries, but, be it said frankly, to the tolerance or negligence of the authorities or the insufficiency of health departments. Combined with these causes, the desire of certain countries to facilitate traffic in their ports has prevented the development among those on board ship of an adequate comprehension of the danger, and has brought about a lack of cooperation with the health authorities, so that it may be asserted that there is not among ships' personnel one ally, determined and interested, in the fight against rodents.
>
> Aware of this situation, at the end of the year 1934, after having prepared a select personnel to carry out rodent control on board, we began investigations especially directed against vessels which were suspicious to us because of their origin, because of their having been exempted from fumigation, or because they came to load grain; demonstrating that in a goodly number of them rats existed in open contradiction of the testimony offered in the certificates of fumigation or exemption which they carried. * * *
>
> In previous times, by virtue of the faith in their certificates, these boats would have pursued their traffic tranquilly armed with the bill of indemnity given by their papers. With our new procedure we try to avoid the propagation of rats on board ship and, consequently, epizootics, thus fulfilling one requirement of plague prevention, all the more important to our country because it is a grain-exporting one.
>
> Our system of rat control on vessels disregards certification as to the sanitary conditions until an inspection has been made concerning rodent status.
>
> The existence of live rats seen during the inspection, evidence of an unusual mortality, and the finding of abundant traces of rats are the signal for a more thorough search complemented by the placing of traps on board in order to estimate the extent of the rodent population and to determine whether or not the vessel should be fumigated * * *.

It would seem from the foregoing tables and from Dr. Sussini's lucid if pungent comment (by no means unwarranted) in explanation of his policies that his position with regard to fumigation of rat-infested vessels is well taken; if he has erred, it has been in his somewhat more rigorous treatment of Argentine vessels and not in the case of vessels from foreign ports.

REFERENCE

(*1*) Actas de la Tercera Conferencia Panamericana de Directores Nacionales de Sanidad (April 4–15, 1936), pp. 223–231.

## Comment

By C. L. WILLIAMS, *Assistant Surgeon General, Division of Foreign and Insular Quarantine and Immigration, United States Public Health Service*

Under date of March 1, 1938, the Quarantine Division of the United States Public Health Service issued to its principal stations a letter transmitting a summary regarding fumigations and rats recovered for various countries, including the United States and Argentina, in which skepticism was expressed as to the value of exemption certificates issued in England and France, based in this instance on the fact that the rats per ship killed by fumigation in those countries was very high, suggesting that only heavily infested ships were fumigated. This skepticism finds support in the itemized figures presented by Dr. Lloyd, wherein are listed large numbers of rats killed on ships in Argentina despite certification, at foreign ports, of deratization or exemption within relatively short periods. It is only fair to state that in England, and possibly other countries, permissible infestation is set at a higher level than in the United States, where an estimate of more than five rats is generally sufficient basis for fumigation. Conversely, of course, vessels infested with fewer than five rats are seldom fumigated in the United States, so that the figure showing rats per fumigated ship is not materially lowered by inclusion of vessels found uninfested.

## CANCER MORTALITY IN THE UNITED STATES FOR 1936 AND RECENT PRECEDING YEARS

The accompanying table (table 1) gives the number of deaths from cancer in the United States for 1936 and certain prior years according to the principal anatomical site of the tumor and by sex of the decedent. It is taken from a report [1] recently issued by the Bureau of the Census, Department of Commerce.

[1] Vital Statistics—Special Reports, vol. 4, No. 54, April 29, 1938, p. 962.

In 1936 cancer was second among the diseases as a cause of death in the United States, with a rate of 111.0 per 100,000 population, as compared with a rate of 265.8 for diseases of the heart, which held first place as "Captain of the men of death." In 1935 the cancer death rate was 107.9, 106.2 in 1934, 102.2 in 1933, and 102.0 in 1932. These rates may be compared with a rate of 83.2 in 1920 and of 97.2 in 1930.

TABLE 1.—*Number of deaths from cancer, by sex and site, in the registration area 1936 and prior years*

| Cause of death | 1936 | | 1935 | | 1930 [1] | | 1925 [1] | | 1920 [1] | |
|---|---|---|---|---|---|---|---|---|---|---|
| | M. | F. | M. | F. | M. | F. | M. | F. | M. | F. |
| Cancer and other malignant tumors (45–53) | 65,545 | 77,068 | 62,933 | 74,716 | 51,777 | 63,488 | 41,865 | 53,639 | 30,933 | 41,998 |
| Cancer of the buccal cavity and pharynx (45) | 4,004 | 989 | 3,982 | 923 | 3,685 | 869 | 3,475 | 759 | 2,335 | 462 |
| Lip | 681 | 83 | 671 | 56 | 540 | 46 | 483 | 70 | 393 | 44 |
| Tongue | 887 | 210 | 878 | 198 | 800 | 147 | 749 | 117 | 609 | 69 |
| Mouth | 487 | 133 | 441 | 109 | 335 | 104 | 285 | 56 | 176 | 61 |
| Jaw | 724 | 226 | 776 | 223 | 811 | 240 | 888 | 223 | 856 | 204 |
| Other and unspecified parts of buccal cavity | 524 | 126 | 466 | 134 | 411 | 109 | 295 | 76 | 211 | 56 |
| Pharynx | 701 | 211 | 750 | 203 | 788 | 223 | 775 | 217 | 90 | 28 |
| Cancer of the digestive tract, peritoneum (46) | 36,280 | 31,959 | 35,224 | 31,237 | 30,431 | 27,381 | 25,375 | 24,080 | 19,058 | 19,285 |
| Esophagus | 1,846 | 540 | 1,715 | 541 | 1,464 | 432 | 1,307 | 352 | 871 | 232 |
| Stomach and duodenum | 16,210 | 11,031 | 16,077 | 11,027 | 14,847 | 10,561 | (2) | (2) | (2) | (2) |
| Intestines (except duodenum, rectum, anus) | 6,833 | 8,531 | 6,428 | 8,037 | 4,826 | 6,170 | (2) | (2) | (2) | (2) |
| Rectum and anus | 3,975 | 3,350 | 3,824 | 3,237 | 2,764 | 2,431 | 2,082 | 1,959 | 1,373 | 1,443 |
| Liver and biliary passages | 4,490 | 5,935 | 4,434 | 6,045 | 4,452 | 5,936 | 4,028 | 5,530 | 3,450 | 5,193 |
| Pancreas | 2,446 | 1,994 | 2,309 | 1,809 | 1,656 | 1,313 | 991 | 911 | 665 | 515 |
| Mesentery and peritoneum | 462 | 560 | 424 | 526 | 398 | 497 | 349 | 471 | 259 | 425 |
| Others under this title | 18 | 18 | 13 | 15 | 24 | 41 | 25 | 45 | 20 | 34 |
| Cancer of the respiratory system (47) | 4,931 | 1,909 | 4,478 | 1,723 | 2,688 | 1,160 | (2) | (2) | (2) | (2) |
| Larynx | 1,069 | 170 | 987 | 165 | 854 | 129 | 636 | 138 | 409 | 90 |
| Lungs and pleura | 3,099 | 1,549 | 2,951 | 1,405 | 1,673 | 980 | 989 | 739 | 527 | 429 |
| Other respiratory organs | 763 | 190 | 540 | 153 | 161 | 51 | (2) | (2) | (2) | (2) |
| Cancer of the uterus (48) | ------ | 16,280 | ------ | 15,853 | ------ | 14,132 | ------ | 12,377 | ------ | 9,848 |
| Cancer of other female genital organs (49) | ------ | 3,553 | ------ | 3,345 | ------ | 2,290 | ------ | 1,674 | ------ | 949 |
| Ovary and Fallopian tube | ------ | 2,941 | ------ | 2,795 | ------ | 1,833 | ------ | 1,218 | ------ | 652 |
| Vagina and vulva | ------ | 568 | ------ | 509 | ------ | 409 | ------ | 398 | ------ | 247 |
| Other female genital organs | ------ | 44 | ------ | 41 | ------ | 48 | ------ | 58 | ------ | 50 |
| Cancer of the breast (50) | 171 | 13,537 | 162 | 13,064 | 138 | 10,774 | 138 | 8,373 | 88 | 6,577 |
| Cancer of the male genito-urinary organs (51) | 12,356 | ------ | 11,702 | ------ | 8,661 | ------ | (2) | ------ | (2) | ------ |
| Kidneys and suprarenals (male) | 1,244 | ------ | 1,178 | ------ | 924 | ------ | 717 | ------ | 439 | ------ |
| Bladder (male) | 3,148 | ------ | 3,014 | ------ | 2,512 | ------ | 2,095 | ------ | 1,494 | ------ |
| Prostate | 7,140 | ------ | 6,765 | ------ | 4,648 | ------ | 3,068 | ------ | 1,597 | ------ |
| Testes | 476 | ------ | 412 | ------ | 270 | ------ | 227 | ------ | 143 | ------ |
| Scrotum | 26 | ------ | 34 | ------ | 30 | ------ | 16 | ------ | (2) | ------ |
| Other male genito-urinary organs | 322 | ------ | 299 | ------ | 277 | ------ | (2) | ------ | (2) | ------ |
| Cancer of the skin (52) | 2,065 | 1,339 | 2,113 | 1,278 | 1,852 | 1,167 | 1,636 | 988 | 1,505 | 862 |
| Cancer of other or unspecified organs (53) | 5,738 | 7,502 | 5,272 | 7,293 | 4,322 | 5,715 | (2) | (2) | (2) | (2) |
| Kidneys and suprarenals (female) | ------ | 831 | ------ | 870 | ------ | 705 | ------ | 541 | ------ | 381 |
| Bladder (female) | ------ | 1,505 | ------ | 1,485 | ------ | 1,172 | ------ | 913 | ------ | 650 |
| Brain | 750 | 534 | 654 | 487 | 467 | 337 | 223 | 200 | 96 | 88 |
| Bones (except of jaw) | 1,063 | 913 | 889 | 875 | 858 | 753 | 591 | 558 | 343 | 406 |
| Other or unspecified organs | 3,925 | 3,719 | 3,729 | 3,576 | 2,997 | 2,748 | (2) | (2) | (2) | (2) |

[1] The percent of population included in registration area for 1930 was 96.2; 1925, 89.6; 1920, 82.3.
[2] Not comparable.

Cancer has shown an almost continuous apparent increase in the United States since 1900; but as it is largely an old-age disease, no accurate measure of any actual change can be made without taking

into consideration the changing age distribution of the population; and other factors, such as improvement in diagnosis and increase in the accuracy of vital statistics, must also be considered. Some investigators have presented standardized data showing actual increases in the general cancer death rate, especially among males,[2] [3] as well as in rates for the higher age groups [4] and for cancer of inaccessible sites.[3]

In a recent analysis of cancer mortality among a large group of policyholders over the period 1911–35,[3] Dr. Louis I. Dublin found that the death rate from this cause showed a moderate upward trend during that period, independent of changes in the composition of the population, but concluded that much, if not all, of the increase was spurious. He states that the increase was practically limited to males, and that among white males the increase was significantly large only at ages above 55 years. Such increase as appeared among white females occurred at ages above 65, while in the broad age period 35–54 the trend was significantly downward. Dr. Dublin states that this difference in the trends by sex must be viewed in the light of the fact that about four-fifths of the cancers among males, but only half of the cancers among females, occur in inaccessible sites. "Thus, improvements in diagnosis over the 25-year period would tend to raise the recorded mortality for males more than for females. In general, cancers of inaccessible sites show a rise in death rate, whereas those in accessible sites exhibit a downward trend."

In 1900 the median age of the population of the United States was 22.8, while in 1930 it was 26.4. In 1930, males comprised 50.6 percent of the population, females 49.4 percent.

TABLE 2.—*Cancer death rate per 100,000 estimated population, 1932–36*

| State | 1936 | 1935 | 1934 | 1933 | 1932 |
|---|---|---|---|---|---|
| United States | 111.0 | 107.9 | 106.2 | 102.2 | 102.0 |
| Alabama | 60.3 | 60.3 | 56.4 | 57.1 | 56.0 |
| Arizona | 76.1 | 73.4 | 76.6 | 61.9 | 64.7 |
| Arkansas | 50.0 | 48.5 | 46.5 | 39.7 | 43.1 |
| California | 144.0 | 139.6 | 133.2 | 129.9 | 127.2 |
| Colorado | 116.7 | 112.2 | 110.1 | 103.6 | 105.2 |
| Connecticut | 129.5 | 130.5 | 128.9 | 127.4 | 122.5 |
| Delaware | 122.0 | 114.1 | 112.6 | 119.6 | 117.8 |
| District of Columbia | 140.2 | 132.8 | 140.4 | 138.7 | 139.5 |
| Florida | 88.4 | 87.9 | 83.5 | 81.8 | 80.4 |
| Georgia | 57.9 | 56.5 | 59.0 | 55.4 | 52.0 |
| Idaho | 92.6 | 77.9 | 79.9 | 82.8 | 75.0 |
| Illinois | 132.0 | 128.8 | 124.1 | 118.6 | 117.4 |
| Indiana | 115.4 | 116.0 | 114.6 | 109.0 | 111.8 |
| Iowa | 131.9 | 126.9 | 123.6 | 120.8 | 119.9 |

[3] The mortality from cancer. A study of the experience among the industrial policyholders of the Metropolitan Life Insurance Co., 1911–30. Monograph 1.

[3] Statistics on morbidity from cancer in the United States. By Louis I. Dublin, Amer. J. Cancer, vol. 29, No. 4 (April 1937), pp. 735–742.

[4] Cancer mortality in the 10 original registration States—Trend for the period 1900–1920. By J. W. Schereschewsky. Pub. Health Rep., vol. 41, No. 1 (Jan. 1, 1936) pp. 1–12.

TABLE 2.—*Cancer death rate per 100,000 estimated population, 1932–36*—Contd.

| State | 1936 | 1935 | 1934 | 1933 | 1932 |
|---|---|---|---|---|---|
| Kansas | 114.5 | 109.7 | 113.9 | 108.0 | 105.3 |
| Kentucky | 74.6 | 71.0 | 73.6 | 73.9 | 74.3 |
| Louisiana | 81.7 | 80.8 | 74.0 | 74.1 | 74.5 |
| Maine | 151.3 | 148.5 | 140.6 | 141.7 | 144.1 |
| Maryland | 128.1 | 128.6 | 126.9 | 119.4 | 117.4 |
| Massachusetts | 153.0 | 147.7 | 153.6 | 147.3 | 143.1 |
| Michigan | 116.4 | 110.8 | 111.9 | 105.1 | 101.3 |
| Minnesota | 133.5 | 131.4 | 130.4 | 131.0 | 127.2 |
| Mississippi | 64.6 | 59.8 | 58.5 | 56.8 | 56.5 |
| Missouri | 118.0 | 117.5 | 118.6 | 109.1 | 111.5 |
| Montana | 106.8 | 99.4 | 89.8 | 95.3 | 95.9 |
| Nebraska | 114.7 | 110.5 | 112.8 | 104.4 | 103.9 |
| Nevada | 95.0 | 89.9 | 98.0 | 85.4 | 89.5 |
| New Hampshire | 148.2 | 155.4 | 151.2 | 149.1 | 155.8 |
| New Jersey | 124.7 | 120.3 | 119.8 | 115.8 | 110.8 |
| New Mexico | 55.7 | 54.0 | 57.8 | 51.2 | 52.4 |
| New York | 148.4 | 144.4 | 137.8 | 133.4 | 128.6 |
| North Carolina | 51.6 | 52.1 | 52.2 | 51.9 | 49.9 |
| North Dakota | 83.5 | 79.7 | 83.8 | 75.9 | 75.8 |
| Ohio | 127.5 | 123.3 | 120.4 | 113.9 | 114.8 |
| Oklahoma | 67.6 | 60.5 | 63.0 | 60.9 | 55.7 |
| Oregon | 135.1 | 122.9 | 130.2 | 127.8 | 116.7 |
| Pennsylvania | 118.9 | 114.5 | 113.9 | 108.2 | 107.7 |
| Rhode Island | 145.5 | 146.8 | 137.6 | 140.8 | 145.0 |
| South Carolina | 50.6 | 49.1 | 52.7 | 48.2 | 41.6 |
| South Dakota | 90.9 | 91.2 | 87.9 | 83.5 | 82.9 |
| Tennessee | 67.9 | 66.3 | 64.7 | 60.7 | 59.1 |
| Texas | 73.6 | 68.5 | 66.3 | 64.5 | (1) |
| Utah | 81.2 | 85.2 | 79.6 | 78.4 | 78.1 |
| Vermont | 137.6 | 139.5 | 125.1 | 127.8 | 137.0 |
| Virginia | 77.8 | 78.5 | 76.3 | 75.0 | 72.0 |
| Washington | 133.3 | 132.5 | 130.2 | 120.9 | 112.6 |
| West Virginia | 71.6 | 72.1 | 68.3 | 67.6 | 63.4 |
| Wisconsin | 135.0 | 132.2 | 128.4 | 123.4 | 122.2 |
| Wyoming | 73.8 | 67.2 | 74.9 | 71.7 | 69.0 |

[1] Not in the death registration area in 1932.

Table 2, compiled from the Vital Statistics Summaries for States, issued as special reports by the Bureau of the Census, presents the death rates for cancer for the United States and for each State from 1932 to 1936. The lowest rate in 1936 is that for Arkansas, 50, and the highest is that for Massachusetts, 153. New Hampshire was the only State that registered a decrease in 1936 as compared with 1932, although only very small increases were shown for several other States, notably Kentucky, New Mexico, North Carolina, Rhode Island, and Vermont.

Without detailed analysis it would appear that the differential factor of greatest importance involved in the difference between the cancer mortality rates for the northern States and those for the southern States is the Negro population, as the rate is much lower among the Negroes than among white persons. In a review of cancer mortality among a large group of industrial insurance policyholders for the decades 1911–30, it has been shown [4] that, for ages 1–74 combined, the cancer death rate among white persons exceeded that for the colored by 78 percent for males and by 5 percent for females.

[4] See footnote 2.

TABLE 3.—*Death rates for cancer per 100,000 estimated population by geographical regions, 1936*

| | |
|---|---|
| **New England** | **146.5** |
| Maine | 151.3 |
| New Hampshire | 148.2 |
| Vermont | 137.6 |
| Massachusetts | 153.0 |
| Rhode Island | 145.5 |
| Connecticut | 129.5 |
| **Middle Atlantic** | **133.7** |
| New York | 148.4 |
| New Jersey | 124.7 |
| Pennsylvania | 118.9 |
| **East North Central** | **126.0** |
| Ohio | 127.5 |
| Indiana | 115.4 |
| Illinois | 132.0 |
| Michigan | 116.4 |
| Wisconsin | 135.0 |
| **West North Central** | **119.6** |
| Minnesota | 133.5 |
| Iowa | 131.9 |
| Missouri | 118.0 |
| North Dakota | 83.5 |
| **West North Central—Continued.** | |
| South Dakota | 90.9 |
| Nebraska | 114.7 |
| Kansas | 114.5 |
| **South Atlantic** | **74.2** |
| Delaware | 122.0 |
| Maryland | 128.1 |
| District of Columbia | 140.2 |
| Virginia | 77.8 |
| West Virginia | 71.6 |
| North Carolina | 51.6 |
| South Carolina | 50.6 |
| Georgia | 57.9 |
| Florida | 88.4 |
| **East South Central** | **67.1** |
| Kentucky | 74.6 |
| Tennessee | 67.9 |
| Alabama | 60.3 |
| Mississippi | 64.6 |
| **West South Central** | **70.0** |
| Arkansas | 50.0 |
| Louisiana | 81.7 |
| Oklahoma | 67.6 |
| Texas | 73.6 |
| **Mountain** | **92.8** |
| Montana | 106.8 |
| Idaho | 92.6 |
| Wyoming | 73.8 |
| Colorado | 116.7 |
| New Mexico | 55.7 |
| Arizona | 76.1 |
| Utah | 81.2 |
| Nevada | 95.0 |
| **Pacific** | **140.9** |
| Washington | 133.3 |
| Oregon | 135.1 |
| California | 144.0 |

TABLE 4.—*Relative position of the States with respect to cancer mortality—States with rates above and below the rate for the United States in 1936*

[Death rates from cancer per 100,000 population]

| | |
|---|---|
| Massachusetts | 153.0 |
| Maine | 151.3 |
| New York | 148.4 |
| New Hampshire | 148.2 |
| Rhode Island | 145.5 |
| California | 144.0 |
| District of Columbia | 140.2 |
| Vermont | 137.6 |
| Oregon | 135.1 |
| Wisconsin | 135.0 |
| Minnesota | 133.5 |
| Washington | 133.3 |
| Illinois | 132.0 |
| Iowa | 131.9 |
| Connecticut | 129.5 |
| Maryland | 128.1 |
| Ohio | 127.5 |
| New Jersey | 124.7 |
| Delaware | 122.0 |
| Pennsylvania | 118.9 |
| Missouri | 118.0 |
| Colorado | 116.7 |
| Michigan | 116.4 |
| Indiana | 115.4 |
| Nebraska | 114.7 |
| Kansas | 114.5 |
| United States | 111.0 |
| Montana | 106.8 |
| Nevada | 95.0 |
| Idaho | 92.6 |
| South Dakota | 90.9 |
| Florida | 88.4 |
| North Dakota | 83.5 |
| Louisiana | 81.7 |
| Utah | 81.2 |
| Virginia | 77.8 |
| Arizona | 76.1 |
| Kentucky | 74.6 |
| Wyoming | 73.8 |

TABLE 4.—*Relative position of the States with respect to cancer mortality—States with rates above and below the rate for the United States in 1936*—Continued

| | |
|---|---|
| Texas | 73. 6 |
| West Virginia | 71. 6 |
| Tennessee | 67. 9 |
| Oklahoma | 67. 6 |
| Mississippi | 64. 6 |
| Alabama | 60. 3 |
| Georgia | 57. 9 |
| New Mexico | 55. 7 |
| North Carolina | 51. 6 |
| South Carolina | 50. 6 |
| Arkansas | 50. 0 |

In tables 3 and 4 the cancer mortality data issued by the Bureau of the Census are arranged by geographic divisions and by groups of States having rates above and below the rate for the country as a whole. The rates for the geographic areas have been computed from the deaths by States furnished by the Census Bureau.

The Public Health Service has now in process of preparation a study of the trend of cancer mortality in the United States which will present an analysis of the problem with reference to geographic areas, age, sex, and racial composition of the population, and anatomical site. This study will bring to date an earlier report covering the period 1900–1920.[5]

## DEATHS DURING WEEK ENDED APRIL 30, 1938

[From the Weekly Health Index, issued by the Bureau of the Census, Department of Commerce]

| | Week ended Apr. 30, 1938 | Corresponding week, 1937 |
|---|---|---|
| Data from 86 large cities of the United States: | | |
| Total deaths | 8,459 | 8,858 |
| Average for 3 prior years | 9,129 | |
| Total deaths, first 17 weeks of year | 150,483 | 169,821 |
| Deaths under 1 year of age | 518 | 497 |
| Average for 3 prior years | 500 | |
| Deaths under 1 year of age, first 17 weeks of year | 9,227 | 10,459 |
| Data from industrial insurance companies: | | |
| Policies in force | 69,497,184 | 69,704,534 |
| Number of death claims | 13,272 | 14,151 |
| Death claims per 1,000 policies in force, annual rate | 10.0 | 10.6 |
| Death claims per 1,000 policies, first 17 weeks of year, annual rate | 10.0 | 11.4 |

[5] The course of cancer mortality in the ten original registration States for the 21-year period 1900-1920. By J. W. Schereschewsky, Pub. Health Bull. No. 155 (1925).

# PREVALENCE OF DISEASE

*No health department, State or local, can effectively prevent or control disease without knowledge of when, where, and under what conditions cases are occurring*

## UNITED STATES

### CURRENT WEEKLY STATE REPORTS

These reports are preliminary, and the figures are subject to change when later returns are received by the State health officers.

In these and the following tables a zero (0) is to be interpreted to mean that no cases or deaths occurred while leaders (------) indicate that cases or deaths may have occurred, although none were reported.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 7, 1938 and May 8, 1937*

| Division and State | Diphtheria | | Influenza | | Measles | | Meningococcus meningitis | |
|---|---|---|---|---|---|---|---|---|
| | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 | Week ended May 8, 1937 |
| **New England States:** | | | | | | | | |
| Maine | 3 | 1 | 2 | ------ | 177 | 28 | 1 | 0 |
| New Hampshire | 0 | 0 | ------ | ------ | 64 | 81 | 0 | 0 |
| Vermont | 0 | 1 | ------ | ------ | 83 | ------ | 0 | 0 |
| Massachusetts | 1 | 6 | ------ | ------ | 257 | 683 | 1 | 12 |
| Rhode Island | 0 | 1 | ------ | ------ | 3 | 218 | 0 | 3 |
| Connecticut | 7 | 6 | 5 | 1 | 56 | 373 | 0 | 0 |
| **Middle Atlantic States:** | | | | | | | | |
| New York | 39 | 41 | [1] 6 | [1] 7 | 3,615 | 1,507 | 7 | 9 |
| New Jersey | 13 | 7 | 3 | 10 | 1,070 | 1,989 | 0 | 3 |
| Pennsylvania | 20 | 34 | ------ | ------ | 5,699 | 1,135 | 1 | 9 |
| **East North Central States:** | | | | | | | | |
| Ohio | 23 | 9 | ------ | 11 | 1,468 | 1,015 | 2 | 5 |
| Indiana | 5 | 3 | 2 | 16 | 867 | 771 | 2 | 1 |
| Illinois | 25 | 27 | 6 | 39 | 1,781 | 274 | 2 | 7 |
| Michigan [2] | 6 | 8 | ------ | 3 | 2,714 | 169 | 1 | 3 |
| Wisconsin | 1 | 3 | 33 | 68 | 3,086 | 23 | 1 | 0 |
| **West North Central States:** | | | | | | | | |
| Minnesota | 3 | 3 | 3 | 2 | 254 | 15 | 3 | 4 |
| Iowa | 0 | 2 | 1 | 6 | 253 | 2 | 0 | 0 |
| Missouri | 27 | 4 | 24 | 65 | 598 | 12 | 1 | 0 |
| North Dakota | 0 | 0 | 8 | 2 | 152 | ------ | 1 | 0 |
| South Dakota | 1 | 1 | ------ | ------ | ------ | 2 | 0 | 1 |
| Nebraska | 2 | 0 | ------ | ------ | 233 | 76 | 0 | 2 |
| Kansas | 6 | 2 | 4 | 4 | 621 | 27 | 1 | 2 |
| **South Atlantic States:** | | | | | | | | |
| Delaware [3] | 1 | 0 | ------ | ------ | 10 | 61 | 0 | 0 |
| Maryland [2] | 1 | 13 | 8 | 12 | 72 | 550 | 2 | 6 |
| District of Columbia | 0 | 5 | 1 | ------ | 8 | 103 | 1 | 1 |
| Virginia | 9 | 18 | ------ | ------ | 458 | 490 | 10 | 9 |
| West Virginia | 3 | 9 | 20 | 21 | 570 | 58 | 2 | 9 |
| North Carolina [4] | 12 | 8 | 49 | 31 | 2,040 | 152 | 1 | 4 |
| South Carolina | 9 | 3 | 108 | 211 | 208 | 55 | 1 | 1 |
| Georgia [4] | 6 | 3 | ------ | ------ | 260 | ------ | 1 | 2 |
| Florida [4] | 7 | 3 | 2 | ------ | 216 | 14 | 0 | 1 |
| **East South Central States:** | | | | | | | | |
| Kentucky | 13 | 5 | 7 | 16 | 206 | 445 | 7 | 7 |
| Tennessee | 3 | 14 | 10 | 80 | 179 | 84 | 1 | 7 |
| Alabama [4] | 3 | 6 | 29 | 174 | 342 | 25 | 6 | 10 |
| Mississippi [3] | 6 | 3 | ------ | ------ | ------ | ------ | 0 | 5 |

See footnotes at end of table.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 7, 1938 and May 8, 1937*—Continued

| Division and State | Diphtheria | | Influenza | | Measles | | Meningococcus meningitis | |
|---|---|---|---|---|---|---|---|---|
| | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 | Week ended May 8, 1937 |
| West South Central States: | | | | | | | | |
| Arkansas | 4 | 3 | 19 | 66 | 316 | 2 | 0 | 0 |
| Louisiana | 11 | 14 | 9 | 16 | 75 | 6 | 0 | 1 |
| Oklahoma [5] | 4 | 12 | 75 | 74 | 251 | 79 | 3 | 4 |
| Texas [4] | 22 | 57 | 190 | 365 | 167 | 1,070 | 2 | 5 |
| Mountain States: | | | | | | | | |
| Montana | 3 | 1 | ---- | ---- | 35 | 27 | 0 | 0 |
| Idaho [3] | 0 | 0 | 5 | 3 | 30 | 24 | 0 | 0 |
| Wyoming [3] [6] | 2 | 0 | ---- | ---- | 25 | 4 | 0 | 0 |
| Colorado [6] | 10 | 5 | ---- | ---- | 331 | 17 | 0 | 0 |
| New Mexico | 1 | 3 | 1 | ---- | 128 | 111 | 0 | 1 |
| Arizona | 3 | 1 | 13 | 32 | 18 | 169 | 0 | 0 |
| Utah [3] | 1 | 0 | ---- | ---- | 267 | 29 | 0 | 0 |
| Pacific States: | | | | | | | | |
| Washington | 2 | 2 | ---- | 1 | 38 | 47 | 1 | 3 |
| Oregon [3] | 0 | 0 | 28 | 25 | 47 | 6 | 1 | 0 |
| California | 28 | 48 | 27 | 50 | 686 | 265 | 1 | 1 |
| Total | 346 | 395 | 698 | 1,411 | 30,034 | 12,293 | 64 | 138 |
| First 18 weeks of year | 9,654 | 8,872 | 39,725 | 268,019 | 586,013 | 140,252 | 1,480 | 2,995 |

| Division and State | Poliomyelitis | | Scarlet fever | | Smallpox | | Typhoid and paratyphoid fever | | Whooping cough |
|---|---|---|---|---|---|---|---|---|---|
| | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 |
| New England States: | | | | | | | | | |
| Maine | 0 | 0 | 18 | 20 | 0 | 0 | 1 | 1 | 36 |
| New Hampshire | 0 | 0 | ---- | 17 | 0 | 0 | 1 | 0 | ---- |
| Vermont | 0 | 0 | 16 | 13 | 0 | 0 | 0 | 0 | 58 |
| Massachusetts | 0 | 1 | 325 | 256 | 0 | 0 | 1 | 2 | 124 |
| Rhode Island | 0 | 0 | 12 | 62 | 0 | 0 | 0 | 0 | 20 |
| Connecticut | 0 | 0 | 84 | 159 | 0 | 0 | 0 | 0 | 91 |
| Middle Atlantic States: | | | | | | | | | |
| New York | 2 | 1 | 769 | 979 | 0 | 0 | 6 | 7 | 546 |
| New Jersey | 0 | 0 | 135 | 188 | 0 | 0 | 4 | 1 | 244 |
| Pennsylvania | 2 | 0 | 801 | 894 | 0 | 0 | 8 | 6 | 319 |
| East North Central States: | | | | | | | | | |
| Ohio | 1 | 0 | 226 | 255 | 5 | 0 | 5 | 6 | 113 |
| Indiana | 0 | 0 | 73 | 150 | 47 | 23 | 5 | 1 | 17 |
| Illinois | 0 | 1 | 398 | 618 | 20 | 19 | 7 | 2 | 120 |
| Michigan [3] | 0 | 0 | 374 | 709 | 5 | 3 | 1 | 0 | 213 |
| Wisconsin | 1 | 0 | 128 | 296 | 11 | 3 | 4 | 0 | 179 |
| West North Central States: | | | | | | | | | |
| Minnesota | 0 | 0 | 142 | 132 | 11 | 25 | 1 | 0 | 23 |
| Iowa | 1 | 0 | 137 | 189 | 36 | 26 | 4 | 1 | 31 |
| Missouri | 0 | 0 | 241 | 192 | 19 | 25 | 1 | 8 | 25 |
| North Dakota | 0 | 0 | 41 | 15 | 15 | 33 | 0 | 3 | 57 |
| South Dakota | 0 | 0 | 13 | 46 | 18 | 1 | 0 | 0 | 25 |
| Nebraska | 0 | 0 | 21 | 68 | 36 | 4 | 0 | 0 | 6 |
| Kansas | 0 | 0 | 98 | 244 | 7 | 15 | 1 | 2 | 162 |
| South Atlantic States: | | | | | | | | | |
| Delaware [3] | 0 | 0 | 8 | 9 | 0 | 0 | 0 | 0 | 8 |
| Maryland [3] | 0 | 0 | 86 | 53 | 0 | 0 | 2 | 1 | 64 |
| District of Columbia | 0 | 0 | 20 | 13 | 0 | 0 | 1 | 0 | 5 |
| Virginia | 0 | 0 | 24 | 13 | 0 | 0 | 1 | 5 | 88 |
| West Virginia | 0 | 0 | 36 | 46 | 0 | 0 | 10 | 1 | 59 |
| North Carolina [4] | 0 | 1 | 19 | 31 | 0 | 0 | 5 | 0 | 497 |
| South Carolina | 0 | 0 | 1 | 2 | 0 | 0 | 7 | 2 | 108 |
| Georgia [4] | 1 | 0 | 5 | 8 | 0 | 0 | 8 | 5 | 71 |
| Florida [4] | 1 | 0 | 6 | 10 | 0 | 0 | 5 | 0 | 17 |

See footnotes at end of table.

*Cases of certain communicable diseases reported by telegraph by State health officers for weeks ended May 7, 1938 and May 8, 1937*—Continued

| Division and State | Poliomyelitis | | Scarlet fever | | Smallpox | | Typhoid and paratyphoid fever | | Whooping cough |
|---|---|---|---|---|---|---|---|---|---|
| | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 | Week ended May 8, 1937 | Week ended May 7, 1938 |
| East South Central States: | | | | | | | | | |
| Kentucky | 0 | 0 | 19 | 45 | 10 | 0 | 0 | 4 | 59 |
| Tennessee | 0 | 1 | 27 | 23 | 2 | 0 | 3 | 3 | 29 |
| Alabama [4] | 1 | 1 | 4 | 4 | 0 | 2 | 6 | 0 | 34 |
| Mississippi [2] | 0 | 3 | 6 | 6 | 5 | 1 | 5 | 0 | ---- |
| West South Central States: | | | | | | | | | |
| Arkansas | 1 | 2 | 4 | 10 | 3 | 0 | 4 | 2 | 26 |
| Louisiana | 0 | 1 | 4 | 22 | 1 | 0 | 7 | 9 | 2 |
| Oklahoma [5] | 0 | 3 | 15 | 36 | 32 | 2 | 3 | 1 | 85 |
| Texas [6] | 0 | 0 | 73 | 128 | 18 | 6 | 18 | 19 | 267 |
| Mountain States: | | | | | | | | | |
| Montana | 0 | 0 | 21 | 17 | 11 | 10 | 1 | 2 | 54 |
| Idaho [3] | 0 | 0 | 10 | 22 | 25 | 6 | 1 | 1 | 12 |
| Wyoming [3] [6] | 0 | 0 | 11 | 18 | 2 | 4 | 0 | 0 | 6 |
| Colorado [6] | 0 | 0 | 37 | 29 | 5 | 14 | 7 | 0 | 40 |
| New Mexico | 0 | 0 | 11 | 29 | 1 | 0 | 3 | 4 | 35 |
| Arizona | 1 | 0 | 5 | 11 | 6 | 0 | 1 | 3 | 44 |
| Utah [3] | 0 | 0 | 15 | 4 | 0 | 0 | 0 | 0 | 65 |
| Pacific States: | | | | | | | | | |
| Washington | 0 | 1 | 21 | 34 | 10 | 8 | 4 | 3 | ---- |
| Oregon [3] | 0 | 0 | 41 | 39 | 18 | 10 | 0 | 0 | 11 |
| California | 0 | 5 | 226 | 171 | 75 | 12 | 6 | 5 | 536 |
| Total | 12 | 21 | 4,807 | 6,338 | 454 | 252 | 158 | 110 | 4,661 |
| First 18 weeks of year | 359 | 376 | 105,200 | 123,493 | 9,507 | 5,737 | 2,204 | 1,990 | 76,547 |

[1] New York City only.
[2] Period ended earlier than Saturday.
[3] Rocky Mountain spotted fever, week ended May 7, 1938, 7 cases, as follows: Delaware, 1; Idaho, 4; Wyoming, 1; Oregon, 1.
[4] Typhus fever, week ended May 7, 1938, 32 cases, as follows: North Carolina, 2; Georgia, 11; Florida, 9; Alabama, 2; Texas, 8.
[5] Figures for 1937 are exclusive of Oklahoma City and Tulsa.
[6] Colorado tick fever, week ended May 7, 1938, 4 cases, as follows: Wyoming, 3; Colorado, 1.

## SUMMARY OF MONTHLY REPORTS FROM STATES

The following summary of cases reported monthly by States is published weekly and covers only those States from which reports are received during the current week.

| State | Meningococcus meningitis | Diphtheria | Influenza | Malaria | Measles | Pellagra | Poliomyelitis | Scarlet fever | Smallpox | Typhoid fever |
|---|---|---|---|---|---|---|---|---|---|---|
| *April 1938* | | | | | | | | | | |
| Arkansas | 2 | 42 | 349 | 146 | 1,762 | 74 | 2 | 28 | 39 | 26 |
| Connecticut | 7 | 26 | 18 | ---- | 146 | ---- | 1 | 535 | 0 | 4 |
| Delaware | 0 | 7 | 0 | ---- | 121 | ---- | 0 | 51 | 0 | 1 |
| Washington, D. C. | 3 | 37 | 6 | ---- | 86 | 2 | 0 | 99 | 0 | 3 |
| North Carolina | 7 | 51 | 34 | 26 | 10,470 | 33 | 3 | 118 | 2 | 6 |

*Summary of monthly reports from States*—Continued

*April 1938*

| | Cases |
|---|---|
| Chickenpox: | |
| Arkansas | 99 |
| Connecticut | 648 |
| Delaware | 80 |
| District of Columbia | 217 |
| North Carolina | 602 |
| Conjunctivitis, infectious: | |
| Connecticut | 8 |
| Dysentery: | |
| Connecticut (bacillary) | 1 |
| Encephalitis, epidemic or lethargic: | |
| Connecticut | 1 |
| German measles: | |
| Arkansas | 1 |
| Connecticut | 26 |
| Delaware | 2 |
| North Carolina | 14 |
| Lead poisoning: | |
| Connecticut | 1 |
| Mumps: | |
| Arkansas | 77 |
| Connecticut | 1,073 |
| Delaware | 98 |
| Ophthalmia neonatorum: | |
| North Carolina | 3 |
| Paratyphoid fever: | |
| Connecticut | 1 |
| Rabies in animals: | |
| Arkansas | 22 |
| Connecticut | 5 |
| Delaware | 1 |
| Rabies in man: | |
| Arkansas | 1 |
| Septic sore throat: | |
| Arkansas | 2 |
| Connecticut | 47 |
| North Carolina | 9 |
| Tetanus: | |
| Arkansas | 1 |
| Connecticut | 1 |
| Trachoma: | |
| Arkansas | 1 |
| Trichinosis: | |
| Connecticut | 1 |
| Tularaemia: | |
| Arkansas | 4 |
| Typhus fever: | |
| North Carolina | 2 |
| Undulant fever: | |
| Arkansas | 5 |
| Connecticut | 8 |
| Delaware | 2 |
| North Carolina | 1 |
| Vincent's infection: | |
| North Carolina | 13 |
| Whooping cough: | |
| Arkansas | 221 |
| Connecticut | 256 |
| Delaware | 43 |
| District of Columbia | 54 |
| North Carolina | 1,046 |

## PLAGUE INFECTION FOUND IN FLEAS FROM WOOD RATS IN NEVADA

Under date of May 2, 1938, Senior Surgeon C. R. Eskey reported plague infection found in fleas collected from Mohave Desert wood rats (*Neotoma fuscipes mohavensis*) in Clark County, Nevada, as follows:

165 fleas from 69 rats trapped April 14, 14½ miles northwest of Las Vegas.
115 fleas from 30 rats trapped April 18, 14 miles northwest of Las Vegas.
217 fleas from 79 rats trapped April 19, 17 miles northwest of Las Vegas.
188 fleas from 90 rats trapped April 20, 21 miles northwest of Las Vegas.
310 fleas from 111 rats trapped April 21, 23 miles northwest of Las Vegas.
291 fleas from 110 rats trapped April 22, 17 miles northwest of Las Vegas.

## PLAGUE INFECTION FOUND IN GROUND SQUIRRELS AND FLEAS FROM GROUND SQUIRRELS IN OREGON

Under date of May 2, 1938, Senior Surgeon C. R. Eskey reported plague infection found in a ground squirrel (*Citellus oregonus*) and fleas from ground squirrels in Baker County, Oregon as follows:

Tissue obtained from one ground squirrel found dead April 22, 8 miles northwest of Hereford.
216 fleas from 125 ground squirrels shot April 23, 7 miles northwest of Hereford.

58596°—38——3

## WEEKLY REPORTS FROM CITIES

*City reports for week ended April 30, 1938*

This table summarizes the reports received weekly from a selected list of 140 cities for the purpose of showing a cross section of the current urban incidence of the communicable diseases listed in the table.

| State and city | Diphtheria cases | Influenza | | Measles cases | Pneumonia deaths | Scarlet fever cases | Smallpox cases | Tuberculosis deaths | Typhoid fever cases | Whooping cough cases | Deaths, all causes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases | Deaths | | | | | | | | |
| Data for 90 cities: | | | | | | | | | | | |
| 5-year average | 175 | 177 | 63 | 7,175 | 751 | 2,421 | 22 | 426 | 26 | 1,428 | ---- |
| Current week [1] | 115 | 87 | 34 | 9,091 | 554 | 1,594 | 35 | 396 | 31 | 1,413 | ---- |
| Maine: | | | | | | | | | | | |
| Portland | 0 | ---- | 0 | 8 | 1 | 1 | 0 | 0 | 0 | 15 | 28 |
| New Hampshire: | | | | | | | | | | | |
| Concord | 0 | ---- | 0 | 0 | 1 | 2 | 0 | 1 | 0 | 0 | 15 |
| Manchester | 0 | ---- | 0 | 0 | 1 | 5 | 0 | 0 | 0 | 0 | 21 |
| Nashua | 0 | ---- | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 6 |
| Vermont: | | | | | | | | | | | |
| Barre | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- | ---- |
| Burlington | 0 | ---- | 0 | 15 | 0 | 1 | 0 | 0 | 0 | 3 | 9 |
| Rutland | 0 | ---- | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 7 |
| Massachusetts: | | | | | | | | | | | |
| Boston | 0 | ---- | 0 | 216 | 23 | 99 | 0 | 8 | 0 | 17 | 226 |
| Fall River | 1 | ---- | 0 | 0 | 1 | 3 | 0 | 1 | 0 | 2 | 30 |
| Springfield | 0 | ---- | 0 | 33 | 0 | 5 | 0 | 0 | 0 | 16 | 26 |
| Worcester | 2 | ---- | 0 | 1 | 10 | 16 | 0 | 1 | 0 | 8 | 52 |
| Rhode Island: | | | | | | | | | | | |
| Pawtucket | 0 | ---- | 0 | 4 | 0 | 0 | 0 | 0 | 0 | 3 | 19 |
| Providence | 0 | 1 | 0 | 1 | 12 | 11 | 0 | 1 | 0 | 11 | 66 |
| Connecticut: | | | | | | | | | | | |
| Bridgeport | 0 | 1 | 1 | 0 | 1 | 6 | 0 | 0 | 0 | 2 | 34 |
| Hartford | 0 | ---- | 0 | 0 | 2 | 24 | 0 | 0 | 0 | 1 | 39 |
| New Haven | 0 | 2 | 0 | 0 | 1 | 2 | 0 | 0 | 0 | 6 | 39 |
| New York: | | | | | | | | | | | |
| Buffalo | 0 | ---- | 0 | 3 | 7 | 55 | 0 | 6 | 0 | 14 | 157 |
| New York | 25 | 15 | 4 | 2,592 | 99 | 253 | 0 | 92 | 3 | 308 | 1,527 |
| Rochester | 1 | ---- | 0 | 6 | 6 | 24 | 0 | 2 | 0 | 5 | 71 |
| Syracuse | 0 | ---- | 0 | 36 | 6 | 2 | 0 | 2 | 0 | 7 | 50 |
| New Jersey: | | | | | | | | | | | |
| Camden | 0 | ---- | 0 | 25 | 2 | 7 | 0 | 1 | 0 | 3 | 27 |
| Newark | 0 | 1 | 0 | 10 | 8 | 18 | 0 | 10 | 1 | 33 | 115 |
| Trenton | 0 | ---- | 0 | 0 | 5 | 0 | 0 | 1 | 0 | 3 | 35 |
| Pennsylvania: | | | | | | | | | | | |
| Philadelphia | 3 | ---- | 5 | 826 | 36 | 108 | 0 | 19 | 2 | 39 | 505 |
| Pittsburgh | 2 | ---- | 0 | 113 | 15 | 35 | 0 | 11 | 1 | 37 | 169 |
| Reading | 0 | ---- | 0 | 13 | 4 | 1 | 0 | 0 | 1 | 4 | 33 |
| Scranton | 0 | ---- | ---- | 30 | ---- | 2 | 0 | ---- | 0 | 1 | ---- |
| Ohio: | | | | | | | | | | | |
| Cincinnati | 10 | 1 | 2 | 8 | 5 | 5 | 0 | 10 | 0 | 17 | 136 |
| Cleveland | 1 | 8 | 1 | 307 | 12 | 57 | 0 | 14 | 3 | 48 | 173 |
| Columbus | 1 | ---- | 0 | 66 | 4 | 6 | 0 | 4 | 0 | 4 | 83 |
| Toledo | 0 | ---- | 0 | 96 | 3 | 11 | 0 | 5 | 0 | 18 | 78 |
| Indiana: | | | | | | | | | | | |
| Anderson | 1 | ---- | 0 | 124 | 2 | 1 | 1 | 1 | 0 | 2 | 6 |
| Fort Wayne | 0 | ---- | 0 | 33 | 4 | 4 | 0 | 0 | 0 | 0 | 25 |
| Indianapolis | 5 | ---- | 0 | 307 | 12 | 27 | 3 | 5 | 0 | 7 | 94 |
| Muncie | 0 | ---- | 0 | 2 | 1 | 1 | 15 | 1 | 0 | 0 | 11 |
| South Bend | 1 | ---- | 0 | 112 | 1 | 5 | 1 | 0 | 0 | 0 | 20 |
| Terre Haute | 0 | ---- | 0 | 8 | 0 | 2 | 3 | 0 | 0 | 0 | 17 |
| Illinois: | | | | | | | | | | | |
| Alton | 0 | ---- | 0 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 7 |
| Chicago | 12 | 2 | 1 | 780 | 32 | 233 | 3 | 45 | 2 | 42 | 705 |
| Elgin | 0 | ---- | 0 | 0 | 0 | 9 | 0 | 0 | 0 | 1 | 9 |
| Moline | 0 | ---- | 0 | 4 | 2 | 7 | 0 | 0 | 0 | 1 | 11 |
| Springfield | 0 | ---- | 0 | 42 | 1 | 4 | 2 | 0 | 0 | 0 | 19 |
| Michigan: | | | | | | | | | | | |
| Detroit | 1 | 1 | 0 | 931 | 11 | 126 | 0 | 15 | 0 | 161 | 243 |
| Flint | 0 | ---- | 0 | 160 | 5 | 42 | 0 | 0 | 0 | 18 | 26 |
| Grand Rapids | 0 | ---- | 0 | 165 | 3 | 11 | 0 | 0 | 0 | 1 | 31 |
| Wisconsin: | | | | | | | | | | | |
| Kenosha | 0 | ---- | 0 | 125 | 0 | 0 | 0 | 0 | 0 | 1 | 5 |
| Milwaukee | 1 | ---- | 0 | 162 | 6 | 16 | 0 | 4 | 1 | 81 | 100 |
| Racine | 0 | ---- | 0 | 479 | 0 | 5 | 0 | 1 | 0 | 15 | 11 |
| Superior | 0 | ---- | 0 | 12 | 2 | 5 | 0 | 0 | 0 | 0 | 11 |

[1] Figures for Barre, Vt., and St. Joseph, Mo., estimated; reports not received.

*City reports for week ended April 30, 1938*—Continued

| State and city | Diphtheria cases | Influenza | | Measles cases | Pneumonia deaths | Scarlet fever cases | Smallpox cases | Tuberculosis deaths | Typhoid fever cases | Whooping cough cases | Deaths, all causes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases | Deaths | | | | | | | | |
| Minnesota: | | | | | | | | | | | |
| Duluth | 0 | ------ | 0 | 12 | 6 | 5 | 0 | 0 | 0 | 7 | 37 |
| Minneapolis | 1 | ------ | 0 | 134 | 4 | 19 | 6 | 1 | 0 | 4 | 86 |
| St. Paul | 0 | ------ | 0 | 3 | 7 | 9 | 0 | 3 | 0 | 4 | 65 |
| Iowa: | | | | | | | | | | | |
| Cedar Rapids | 0 | ------ | -------- | 2 | ------- | 5 | 0 | ------- | 0 | 5 | -------- |
| Davenport | 0 | ------ | -------- | 0 | ------- | 2 | 0 | ------- | 0 | 0 | -------- |
| Des Moines | 0 | ------ | 0 | 10 | 0 | 38 | 4 | 0 | 1 | 0 | 29 |
| Sioux City | 0 | ------ | -------- | 29 | ------- | 5 | 0 | ------- | 0 | 4 | -------- |
| Waterloo | 0 | ------ | -------- | 77 | ------- | 15 | 0 | ------- | 0 | 0 | -------- |
| Missouri: | | | | | | | | | | | |
| Kansas City | 1 | ------ | 0 | 15 | 12 | 13 | 0 | 7 | 0 | 0 | 104 |
| St. Joseph | ------- | ------ | -------- | ------- | ------- | ------- | ------- | ------- | ------- | ------- | -------- |
| St. Louis | 5 | ------ | 0 | 10 | 10 | 87 | 1 | 8 | 0 | 3 | 223 |
| North Dakota: | | | | | | | | | | | |
| Fargo | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 9 | 10 |
| Grand Forks | 0 | ------ | -------- | 56 | ------- | 1 | 0 | ------- | 0 | 0 | -------- |
| Minot | 0 | ------ | 0 | 0 | 0 | 0 | 6 | 0 | 0 | 2 | 6 |
| South Dakota: | | | | | | | | | | | |
| Aberdeen | 0 | ------ | -------- | 0 | ------- | 0 | 0 | ------- | 0 | 6 | -------- |
| Sioux Falls | 0 | ------ | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 11 |
| Nebraska: | | | | | | | | | | | |
| Omaha | 0 | ------ | 0 | 96 | 6 | 1 | 1 | 1 | 0 | 0 | 60 |
| Kansas: | | | | | | | | | | | |
| Lawrence | 0 | ------ | 0 | 40 | 0 | 0 | 0 | 0 | 0 | 0 | 11 |
| Topeka | 0 | ------ | 0 | 152 | 1 | 2 | 0 | 0 | 0 | 21 | 18 |
| Wichita | 0 | ------ | 0 | 26 | 3 | 2 | 1 | 0 | 0 | 5 | 25 |
| Delaware: | | | | | | | | | | | |
| Wilmington | 2 | ------ | 0 | 8 | 2 | 7 | 0 | 2 | 0 | 6 | 29 |
| Maryland: | | | | | | | | | | | |
| Baltimore | 1 | 3 | 2 | 19 | 14 | 53 | 0 | 16 | 0 | 44 | 211 |
| Cumberland | 0 | ------ | 0 | 3 | 1 | 1 | 0 | 0 | 0 | 2 | 16 |
| Frederick | 0 | ------ | 0 | 1 | 0 | 0 | 0 | 0 | 2 | 0 | -------- |
| Dist. of Col.: | | | | | | | | | | | |
| Washington | 5 | 2 | 2 | 25 | 11 | 18 | 0 | 11 | 0 | 15 | 171 |
| Virginia: | | | | | | | | | | | |
| Lynchburg | 0 | ------ | 0 | 1 | 2 | 0 | 0 | 0 | 0 | 3 | 7 |
| Norfolk | 0 | ------ | 0 | 10 | 5 | 2 | 0 | 1 | 0 | 0 | 23 |
| Richmond | 0 | ------ | 1 | 113 | 6 | 2 | 0 | 3 | 0 | 0 | 53 |
| Roanoke | 0 | ------ | 0 | 2 | 1 | 1 | 0 | 0 | 0 | 0 | 9 |
| West Virginia: | | | | | | | | | | | |
| Charleston | 0 | ------ | 0 | 1 | 4 | 1 | 0 | 2 | 1 | 2 | 24 |
| Huntington | 0 | ------ | -------- | 4 | ------- | 0 | 0 | ------- | 0 | 0 | -------- |
| Wheeling | 0 | ------ | 0 | 307 | 4 | 6 | 0 | 1 | 0 | 1 | 35 |
| North Carolina: | | | | | | | | | | | |
| Gastonia | 0 | ------ | -------- | 39 | ------- | 0 | 0 | ------- | 0 | 8 | -------- |
| Raleigh | 0 | ------ | 0 | 99 | 1 | 1 | 0 | 1 | 0 | 5 | 18 |
| Wilmington | 0 | ------ | 0 | 38 | 1 | 0 | 0 | 0 | 0 | 9 | 13 |
| Winston-Salem | 0 | 1 | 0 | 25 | 2 | 0 | 0 | 0 | 0 | 32 | 12 |
| South Carolina: | | | | | | | | | | | |
| Charleston | 0 | 11 | 0 | 3 | 4 | 1 | 0 | 0 | 0 | 0 | 13 |
| Florence | 0 | ------ | 0 | 18 | 0 | 0 | 0 | 0 | 0 | 1 | 12 |
| Greenville | 0 | ------ | 0 | 6 | 1 | 0 | 0 | 0 | 0 | 8 | 13 |
| Georgia: | | | | | | | | | | | |
| Atlanta | 0 | 4 | 2 | 11 | 9 | 4 | 0 | 5 | 2 | 7 | 76 |
| Brunswick | 0 | ------ | 0 | 16 | 0 | 0 | 0 | 1 | 0 | 0 | 6 |
| Savannah | 1 | 1 | 1 | 26 | 1 | 0 | 0 | 1 | 0 | 0 | 37 |
| Florida: | | | | | | | | | | | |
| Miami | 0 | ------ | 0 | 14 | 2 | 0 | 0 | 3 | 0 | 4 | 37 |
| Tampa | 1 | ------ | 0 | 55 | 1 | 2 | 0 | 1 | 0 | 1 | 21 |
| Kentucky: | | | | | | | | | | | |
| Ashland | 0 | ------ | 0 | 5 | 1 | 1 | 0 | 1 | 0 | 8 | 6 |
| Covington | 12 | ------ | 0 | 0 | 0 | 5 | 0 | 1 | 0 | 4 | 29 |
| Lexington | 0 | ------ | 0 | 0 | 2 | 1 | 0 | 1 | 0 | 5 | 23 |
| Louisville | 0 | ------ | 0 | 169 | 5 | 19 | 0 | 6 | 0 | 13 | 72 |
| Tennessee: | | | | | | | | | | | |
| Knoxville | 0 | ------ | 0 | 29 | 5 | 2 | 0 | 2 | 0 | 4 | 28 |
| Memphis | 0 | ------ | 2 | 18 | 4 | 6 | 1 | 10 | 0 | 2 | 91 |
| Nashville | 0 | ------ | 2 | 67 | 6 | 0 | 0 | 2 | 0 | 6 | 40 |
| Alabama: | | | | | | | | | | | |
| Birmingham | 0 | 10 | 0 | 21 | 3 | 2 | 0 | 4 | 1 | 1 | 79 |
| Mobile | 0 | ------ | 1 | 4 | 4 | 0 | 0 | 1 | 0 | 0 | 25 |
| Montgomery | 0 | ------ | -------- | 144 | ------- | 0 | 0 | ------- | 0 | 5 | -------- |

*City reports for week ended April 30, 1938*—Continued

| State and city | Diphtheria cases | Influenza | | Measles cases | Pneumonia deaths | Scarlet fever cases | Smallpox cases | Tuberculosis deaths | Typhoid fever cases | Whooping cough cases | Deaths, all causes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Cases | Deaths | | | | | | | | |
| Arkansas: | | | | | | | | | | | |
| Fort Smith | 0 | ------ | -------- | 8 | ------- | 2 | 0 | ------- | 0 | 0 | -------- |
| Little Rock | 0 | ------ | -------- | 0 | ------- | 0 | 0 | ------- | 0 | 0 | -------- |
| Louisiana: | | | | | | | | | | | |
| Lake Charles | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| New Orleans | 8 | 2 | 1 | 6 | 7 | 6 | 1 | 13 | 8 | 0 | 131 |
| Shreveport | 0 | ------ | 0 | 5 | 1 | 1 | 0 | 2 | 0 | 0 | 40 |
| Oklahoma: | | | | | | | | | | | |
| Muskogee | 0 | ------ | -------- | 1 | ------- | 0 | 0 | ------- | 0 | 0 | -------- |
| Oklahoma City | 0 | ------ | 0 | 3 | 4 | 5 | 0 | 0 | 0 | 6 | 51 |
| Tulsa | 0 | ------ | -------- | 163 | ------- | 4 | 5 | ------- | 0 | 18 | -------- |
| Texas: | | | | | | | | | | | |
| Dallas | 2 | 3 | 3 | 7 | 3 | 7 | 0 | 4 | 0 | 2 | 71 |
| Fort Worth | 0 | ------ | 0 | 1 | 3 | 4 | 0 | 4 | 0 | 8 | 27 |
| Galveston | 0 | ------ | 0 | 0 | 3 | 0 | 0 | 0 | 0 | 0 | 17 |
| Houston | 1 | 1 | 0 | 2 | 4 | 4 | 7 | 5 | 1 | 0 | 72 |
| San Antonio | 1 | ------ | 0 | 0 | 11 | 0 | 0 | 8 | 1 | 2 | 84 |
| Montana: | | | | | | | | | | | |
| Billings | 0 | ------ | 0 | 0 | 2 | 1 | 0 | 0 | 0 | 2 | 9 |
| Great Falls | 0 | ------ | 0 | 0 | 1 | 4 | 0 | 0 | 0 | 12 | 12 |
| Helena | 0 | ------ | 0 | 1 | 2 | 1 | 0 | 0 | 0 | 2 | 8 |
| Missoula | 0 | ------ | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 7 |
| Idaho: | | | | | | | | | | | |
| Boise | 0 | ------ | 0 | 0 | 0 | 1 | 1 | 0 | 0 | 0 | 4 |
| Colorado: | | | | | | | | | | | |
| Colorado Springs | 0 | ------ | 0 | 1 | 1 | 2 | 0 | 1 | 0 | 1 | 14 |
| Denver | 7 | ------ | 1 | 95 | 6 | 17 | 0 | 1 | 0 | 6 | 91 |
| Pueblo | 0 | ------ | 0 | 36 | 0 | 1 | 0 | 0 | 0 | 7 | 7 |
| New Mexico: | | | | | | | | | | | |
| Albuquerque | 0 | ------ | 0 | 5 | 1 | 0 | 0 | 1 | 1 | 2 | 16 |
| Utah: | | | | | | | | | | | |
| Salt Lake City | 0 | ------ | 0 | 228 | 5 | 9 | 1 | 3 | 0 | 3 | 43 |
| Washington: | | | | | | | | | | | |
| Seattle | 1 | ------ | 2 | 1 | 9 | 4 | 0 | 4 | 0 | 79 | 109 |
| Spokane | 0 | ------ | 0 | 1 | 1 | 0 | 0 | 0 | 1 | 14 | 23 |
| Tacoma | 0 | ------ | 0 | 0 | 2 | 6 | 2 | 0 | 0 | 11 | 35 |
| Oregon: | | | | | | | | | | | |
| Portland | 0 | ------ | 0 | 14 | 6 | 17 | 1 | 3 | 0 | 3 | 67 |
| Salem | 0 | ------ | -------- | 0 | ------- | 0 | 0 | ------- | 0 | 0 | -------- |
| California: | | | | | | | | | | | |
| Los Angeles | 11 | 14 | 0 | 59 | 11 | 49 | 1 | 12 | 0 | 12 | 312 |
| Sacramento | 1 | ------ | 0 | 35 | 1 | 2 | 0 | 0 | 0 | 64 | 26 |
| San Francisco | 0 | 3 | 0 | 3 | 14 | 23 | 0 | 9 | 0 | 85 | 162 |

| State and city | Meningococcus meningitis | | Poliomyelitis cases | State and city | Meningococcus meningitis | | Poliomyelitis cases |
|---|---|---|---|---|---|---|---|
| | Cases | Deaths | | | Cases | Deaths | |
| Massachusetts: | | | | Illinois: | | | |
| Boston | 1 | 0 | 0 | Chicago | 1 | 0 | 0 |
| Rhode Island: | | | | Wisconsin: | | | |
| Providence | 0 | 1 | 0 | Milwaukee | 0 | 0 | 1 |
| New York: | | | | Superior | 1 | 0 | 0 |
| Buffalo | 2 | 0 | 0 | Virginia: | | | |
| New York | 2 | 2 | 0 | Norfolk | 1 | 0 | 0 |
| Pennsylvania: | | | | Kentucky: | | | |
| Philadelphia | 0 | 1 | 0 | Louisville | 0 | 0 | 1 |
| Pittsburgh | 0 | 1 | 0 | Louisiana: | | | |
| Scranton | 1 | 0 | 0 | Shreveport | 0 | 1 | 0 |
| Ohio: | | | | Texas: | | | |
| Columbus | 1 | 1 | 0 | Houston | 1 | 0 | 0 |
| Toledo | 1 | 1 | 0 | California: | | | |
| Indiana: | | | | Los Angeles | 1 | 0 | 0 |
| Indianapolis | 1 | 0 | 0 | | | | |

*Encephalitis, epidemic or lethargic.*—Cases: New York, 1; Newark, 1; Chicago, 3; Milwaukee, 1; Wheeling, 1; Louisville, 1.

*Pellagra.*—Cases: Chicago, 1; Charleston, S. C., 2; Tampa, 1; Savannah, 8; Mobile, 1; Montgomery, 1; Fort Smith, 2; Los Angeles, 2.

*Typhus fever.*—Cases: Charleston, S. C., 1; Atlanta, 1; New Orleans, 1; Galveston, 1; Los Angeles, 1.

# FOREIGN AND INSULAR

## CUBA

*Provinces—Notifiable diseases—4 weeks ended April 2, 1938.*—During the 4 weeks ended April 2, 1938, cases of certain notifiable diseases were reported in the Provinces of Cuba as follows:

| Disease | Pinar del Rio | Habana | Matanzas | Santa Clara | Camaguey | Oriente | Total |
|---|---|---|---|---|---|---|---|
| Cancer | 1 | 3 | 1 | 2 | | 3 | 10 |
| Chickenpox | 2 | 11 | 8 | 48 | 23 | 7 | 99 |
| Diphtheria | | 20 | | 1 | 10 | | 31 |
| Hookworm disease | | 135 | | | | | 135 |
| Leprosy | | | | | | 3 | 3 |
| Malaria | 29 | 15 | 8 | 31 | 10 | 64 | 157 |
| Measles | 5 | 35 | 53 | 4 | | 23 | 120 |
| Poliomyelitis | | | | | | 1 | 1 |
| Scarlet fever | 1 | 3 | | | | | 4 |
| Tuberculosis | 21 | 44 | 12 | 44 | 40 | 33 | 194 |
| Typhoid fever | 28 | 144 | 7 | 23 | 24 | 65 | 291 |
| Whooping cough | | | | 5 | | | 5 |
| Yaws | | | | 23 | 1 | | 24 |

## PANAMA CANAL ZONE

*Notifiable diseases—January-March 1938.*—During the months of January, February, and March 1938, certain notifiable diseases, including imported cases, were reported in the Panama Canal Zone and terminal cities as follows:

| Disease | January | | February | | March | |
|---|---|---|---|---|---|---|
| | Cases | Deaths | Cases | Deaths | Cases | Deaths |
| Chickenpox | 17 | | 13 | | 30 | |
| Diphtheria | 11 | | 19 | 1 | 7 | |
| Dysentery (amoebic) | 7 | | 13 | 2 | 12 | 2 |
| Dysentery (bacillary) | 8 | 3 | 14 | 3 | 19 | 1 |
| Leprosy | 1 | 1 | | 1 | 2 | |
| Malaria | 139 | 4 | 110 | | 78 | |
| Measles | 16 | | 45 | | 29 | |
| Meningococcus meningitis | | | | | 2 | 2 |
| Mumps | 45 | | 26 | | 17 | |
| Paratyphoid fever | | | | | 1 | |
| Pneumonia | | 17 | | 22 | | 14 |
| Relapsing fever | 1 | | | | 1 | |
| Scarlet fever | 3 | | 2 | | 2 | |
| Tuberculosis | | 35 | | 30 | | 37 |
| Typhoid fever | | | 4 | | 1 | |
| Whooping cough | [1] 2 | | [1] 2 | | [1] 7 | |

[1] In Canal Zone only.

## CHOLERA, PLAGUE, SMALLPOX, TYPHUS FEVER, AND YELLOW FEVER

NOTE.—A table giving current information of the world prevalence of quarantinable diseases appeared in the PUBLIC HEALTH REPORTS for April 29, 1938, pages 685–700. A similar cumulative table will appear in future issues of the PUBLIC HEALTH REPORTS for the last Friday of each month.

### Cholera

*Indochina (French).*—During the week ended April 30, 1938, cholera was reported in French Indochina as follows: Annam Province, 229 cases; Tonkin Province, 300 cases; Hanoi, 48 cases.

### Plague

*Bolivia—Santa Cruz Department—Warnes.*—During the period March 21–27, 1938, 1 case of pneumonic plague was reported in Warnes, Santa Cruz Department, Bolivia.

*Brazil—Pernambuco State—Novo Exu District.*—Information dated April 19, 1938, states that 4 deaths from bubonic plague have occurred since March 25, 1938, in Serra da Inveja and Sitio Tramontante in the Novo Exu District, Pernambuco State, Brazil.

*Hawaii Territory—Island of Hawaii—Hamakua District—Paauhau Sector.*—Three rats found on April 26, 28, and 29, 1938, respectively, in Paauhau Sector, Hamakua District, Island of Hawaii, Hawaii Territory, have been proved positive for plague.

*United States.*—A report of plague-infected fleas in Clark County, Nev., and a plague-infected squirrel and plague-infected fleas in Baker County, Oreg., appears on page 825 of this issue of PUBLIC HEALTH REPORTS.

### Typhus Fever

*Bolivia.*—Typhus fever has been reported in Bolivia as follows: La Paz, La Paz Department, March 21–April 3, 2 cases; Oruro, Oruro Department, March 21–April 3, 2 cases; Department of Potosi—Potosi, March 21–27, 1 case; Quijarro, March 21–27, 1 case.

### Yellow Fever

*Brazil.*—Yellow fever has been reported in Brazil as follows: Minas Geraes State, March 23 to April 10, 1938, 3 deaths; Rio de Janeiro State, April 6 to 15, 2 deaths; Santa Catharina State, April 3–12, 8 deaths; Sao Paulo State, March 13–29, 3 deaths.

*Colombia—Cundinamarca Department.*—Yellow fever has been reported in Cundinamarca Department, Colombia, as follows: Caparrapi, March 22, 1938, 1 death; Yacopi, February 22, 1938, 1 death.

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